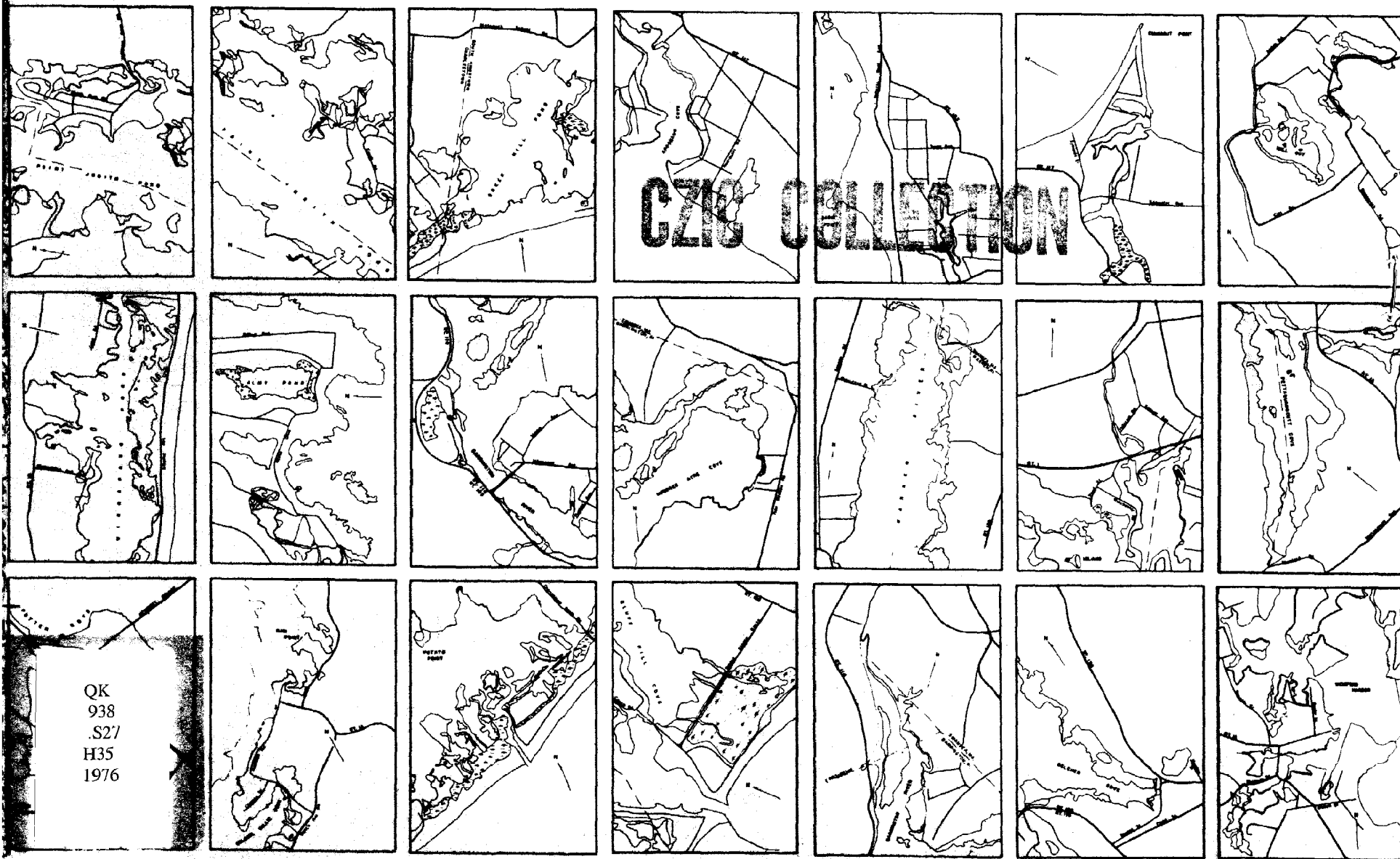


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COASTAL ZONE  
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# Atlas of Rhode Island Salt Marshes



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# Atlas of Rhode Island Salt Marshes

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Prepared for  
The Rhode Island Coastal Resources Management Council

by The Coastal Resources Center



University of Rhode Island  
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CZIC COLLECTION

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Rhode Island Coastal Resources Management Council

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# Forward

This inventory was undertaken as one element of an extensive effort by the Coastal Resources Center to catalog and assess the coastal resources of Rhode Island. This assessment is the foundation for the development of the Rhode Island coastal management plan.

The coastal management plan, which is being developed incrementally, is administered by the Rhode Island Coastal Resources Management Council (CRMC), which was created in 1971 by the state legislature and charged to

*" . . . preserve, protect, develop and where possible restore the coastal resources of the state for this and succeeding generations. . . ."  
(46-23-1, G.L.R.I.)*

The CRMC has direct jurisdiction over all resources and activities below the mean high water mark and over shoreline features including salt marshes. The CRMC operates through the granting of permits for activities within its jurisdiction.

A special effort to map salt marshes was undertaken because their importance has long been recognized, and because they are found at the water's edge along protected shorelines, where human pressures to modify or destroy them are frequently intense. Although the alteration of Rhode Island's marshes has been taking place since the seventeenth century, attempts to learn their precise locations and acreage have begun only recently. Until the release of this document, a detailed and consistent series of maps that have been thoroughly checked in the field has not been available.

It is important to recognize that salt marshes are dynamic features whose borders are constantly

changing in response to land drainage patterns, the use of abutting land, storms, and such gradual, long-term processes as rising sea level. While these maps provide reliable information on the location of salt marsh in 1975 and the shape and size of individual marshes, they cannot be used to infer the precise borders of any marsh at a specific site. Where the boundary of a salt marsh must be precisely established, an on-site inspection is always necessary.

It is our hope that this atlas will assist not only the Coastal Resources Management Council, but also town officials and private citizens concerned with this resource and involved in the management of our shoreline.

Stephen Olsen  
*Coordinator, Coastal Resources Center*

## Acknowledgements

Many hours were spent in the field by Buddy Alves, who assisted William Gardiner in the final survey. Preliminary fieldwork was undertaken by Jane Miner. We also thank Dr. Irene Stuckey and biologists with the Rhode Island Department of Natural Resources, who shared with us their knowledge of the state's salt marshes and reviewed the final maps.

# Introduction

The salt marshes shown in this atlas have been identified according to the definition found in the *State of Rhode Island Coastal Resources Management Council Plan; Policies and Regulations*:

*"An intertidal salt marsh shall be defined as any land which borders or lies beneath the tidal waters of this state and upon which grow one or more of the following plant species: cordgrass (*Spartina alterniflora*); salt meadow grass (*Spartina patens*); spike grass (*Distichlis spicata*); black rush (*Juncus gerardi*); saltworts (*Salicornia* spp.); seaside lavender (*Limonium carolinianum*)."*

Sophisticated techniques, including the use of aerial infrared photography, have been successfully used to map vegetation. The small size of Rhode Island, funding constraints, and the existence of a recent series of black-and-white aerial photographs and land use maps persuaded us, however, to rely on existing data with verification by complete field checking.

Base maps were prepared from land-use and vegetation maps produced by MacConnell (5) from black-and-white aerial photographs of the entire state taken in 1970 at a uniform scale of 1:12,000. Also noted on the base maps were salt marshes identified in a number of other studies. The base maps were then taken into the field, where the entire shoreline of the state was covered on foot or observed from a small boat. Where previously unidentified salt marsh was found, or the base maps deviated from what was observed, direct measurements and field notes were taken.

Black-and-white aeriels taken in 1974 were examined stereoscopically in the lab to determine the

precise outline of any newly identified marsh. In this manner numerous areas of salt marsh that had not appeared in previous surveys were mapped, and mistakes concerning the presence or size of identified marshes were corrected. For the first time, fringe marsh, defined as a band of marsh vegetation five yards or less in width, was mapped. Fringe marshes, however, were noted merely as present or absent. The acreage of fringe marsh was calculated assuming an average width of 2.75 yards.

*Summary results:* A total of 3,668 acres of salt marsh was mapped, including 76 miles (76 acres) of fringe marsh. Tables 1, 2 and 3 list, by town, the acreage, the number of marshes by size class, and the length of fringe marsh.

The salt marshes are concentrated in the following areas: the south shore, Barrington and Warren, Portsmouth, Tiverton, and Warwick. Salt marsh is least abundant in upper Narragansett Bay from Cranston to Pawtucket.

Rhode Island's salt marshes generally show clear patterns of zonation:

— Along the water's edge, salt marsh cordgrass (*Spartina alterniflora*) dominates. The cordgrass growing closest to the water is often significantly taller than the cordgrass behind.

— The second zone is usually dominated by salt meadow cordgrass (*Spartina patens*). On the larger salt marshes this is usually the most extensive plant community present.

— The third zone is made up of two communities: one dominated by spike grass (*Distichlis spicata*), and the other by the black rush (*Juncus gerardi*). Spike grass is frequently concentrated closer to salt water than is black rush.

Other species that may be locally dense but are usually scattered among the dominant species include the following: *Aster tenuifolius* (salt aster), *Atriplex* spp. (orach), *Gerardi maritima* (purple gerardia), *Limonium carolinianum* (sea lavender), *Plantago maritima* (seaside plantain), *Salicornia europaea* (salt wort), *Scirpus maritimus* (salt marsh bullrush), *Spergularia marina* (sand spurrey), *Suaeda maritima* (sea blite) and *Triglochin maritima* (arrow grass).

In general, the variety and complexity of plant communities are greater in the larger marshes. In some marshes the zonation pattern described above is broken into a mosaic pattern; in other — usually smaller — marshes, one or more of the three zones may be present. Fringe marsh is frequently composed almost exclusively of cordgrass.

A comparison between the results of this inventory and others shows the following:

1955 (1)	2,315 acres	} Includes only marshes greater than 40 acres
1959 (2)	2,244 acres	
1964 (3)	2,192 acres	
1962 (4)	4,238 acres	} Includes only marshes greater than approximately five acres
1972 (5)	3,243 acres	
1975 (this survey)	3,668 acres	All marsh including fringe marsh

The earlier surveys of larger marshes show a clear reduction of salt marsh acreage, but the trend in later studies is less clear. The work presented here provides a baseline from which further changes may be accurately monitored.

**Table 1.** Salt marshes in Rhode Island, by town.

<i>Towns</i>	<i>Fringe Marshes (yds.)</i>	<i>Other Marshes (acres)</i>
Westerly	13,745.47	236.69
Charlestown	11,502.73	297.09
South Kingstown	12,623.06	313.79
Narragansett	7,037.83	337.00
North Kingstown	13,627.52	192.51
Warwick	19,582.19	248.86
East Greenwich	367.25	2.30
Cranston	26.23	4.82
Providence	0	3.21
Pawtucket	0	0
East Providence	4,852.92	83.57
Barrington	9,955.04	449.11
Warren	4,354.51	239.66
Bristol	6,361.26	125.34
Tiverton	5,521.84	320.47
Little Compton	393.48	64.07
Portsmouth	14,978.47	437.33
Middletown	262.47	13.77
Newport	1,862.47	35.81
Jamestown	2,715.01	138.88
New Shoreham	4,000.38	48.20
	<u>133,770.08*</u>	<u>3,592.48**</u>

\*133,770.08 yds. = 76.01 miles = 122,300.09 meters = 122.30 km

\*\*3,592.48 acres = 1,454.95 hectares

**Table 2.** Rhode Island's salt marshes, by size class, by town.

<i>Towns</i>	<i>1*</i>	<i>2*</i>	<i>3*</i>	<i>4*</i>	<i>5*</i>
Westerly	42	40	7	1	0
Charlestown	40	36	14	2	0
South Kingstown	63	35	6	3	0
Narragansett	27	35	7	5	0
North Kingstown	61	49	10	0	0
Warwick	48	31	13	1	0
East Greenwich	1	0	0	0	0
Cranston	1	1	0	0	0
Providence	0	1	0	0	0
Pawtucket	0	0	0	0	0
East Providence	25	15	3	1	0
Barrington	44	27	8	4	1
Warren	15	13	6	2	0
Bristol	50	21	3	1	0
Tiverton	24	23	4	0	1
Little Compton	4	7	4	0	0
Portsmouth	79	17	10	5	0
Middletown	1	1	0	0	0
Newport	17	8	2	0	0
Jamestown	20	3	3	2	0
New Shoreham	12	13	3	0	0
<b>Totals</b>	<u>574</u>	<u>376</u>	<u>103</u>	<u>27</u>	<u>2</u>

\*1 = fringe marshes

2 = 0.23-4.9 acres

3 = 5.0-24.9 acres

4 = 25.0-99.9 acres

5 = 100+ acres

**Table 3.** Acreage of Rhode Island salt marshes by town.

<i>Towns</i>	<i>Fringe marshes (acres)</i>	<i>Other marshes (acres)</i>	<i>Total acreage</i>
Westerly	7.80	236.69	244.49
Charlestown	6.53	297.09	303.62
South Kingstown	7.17	313.79	320.96
Narragansett	4.00	337.00	341.00
North Kingstown	7.74	192.51	200.25
Warwick	11.12	248.86	259.98
East Greenwich	0.21	2.30	2.51
Cranston	0.01	4.82	4.83
Providence	0.00	3.21	3.21
Pawtucket	0.00	0.00	0.00
East Providence	2.76	83.57	86.33
Barrington	5.65	449.11	454.76
Warren	2.47	239.66	242.13
Bristol	3.61	125.34	128.95
Tiverton	3.14	320.47	323.61
Little Compton	0.22	64.07	64.29
Portsmouth	8.51	437.33	445.84
Middletown	0.15	13.77	13.92
Newport	1.06	35.81	36.87
Jamestown	1.54	138.88	140.42
New Shoreham	2.27	48.20	50.47
<b>Total</b>	<u>75.96</u>	<u>3,592.48</u>	<u>3,668.44*</u>

\*3,668.44 acres = 1,485.72 hectares

### References Cited

1. Anom. 1965. A Supplementary Report on the Coastal Wetlands Inventory of Rhode Island. U.S. Dept. of the Interior. Fish and Wildlife Service, Div. of River Basin Studies, Boston, MA, 10 pp.
2. Anom., *op. cit.*
3. Anom., *op. cit.*
4. Kupa, J. J. and W. R. Whitman. 1972. Land Cover Types of Rhode Island: an ecological inventory. University of Rhode Island, Agricultural Experiment Station Bulletin 439, 30 pp.
5. MacConnell, W. P. 1974. Remote Sensing Land Use and Vegetative Cover in Rhode Island. Bull. 200, URI-Cooperative Extension Service, 93 pp.

### How To Use This Atlas:

To find, for example, a salt marsh in the upper Providence River, turn first to the orientation map on the following page to locate the general area. In this case it would be area E. Next, turn to Map E and select the numbered inventory map or maps that cover the specific area you're interested in. The inventory maps are numbered consecutively from west to east; they have been prepared using US Geological Survey quadrangle maps as a base.

### Map Symbols



Salt marsh

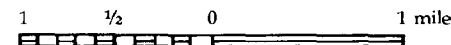


Freshwater marsh

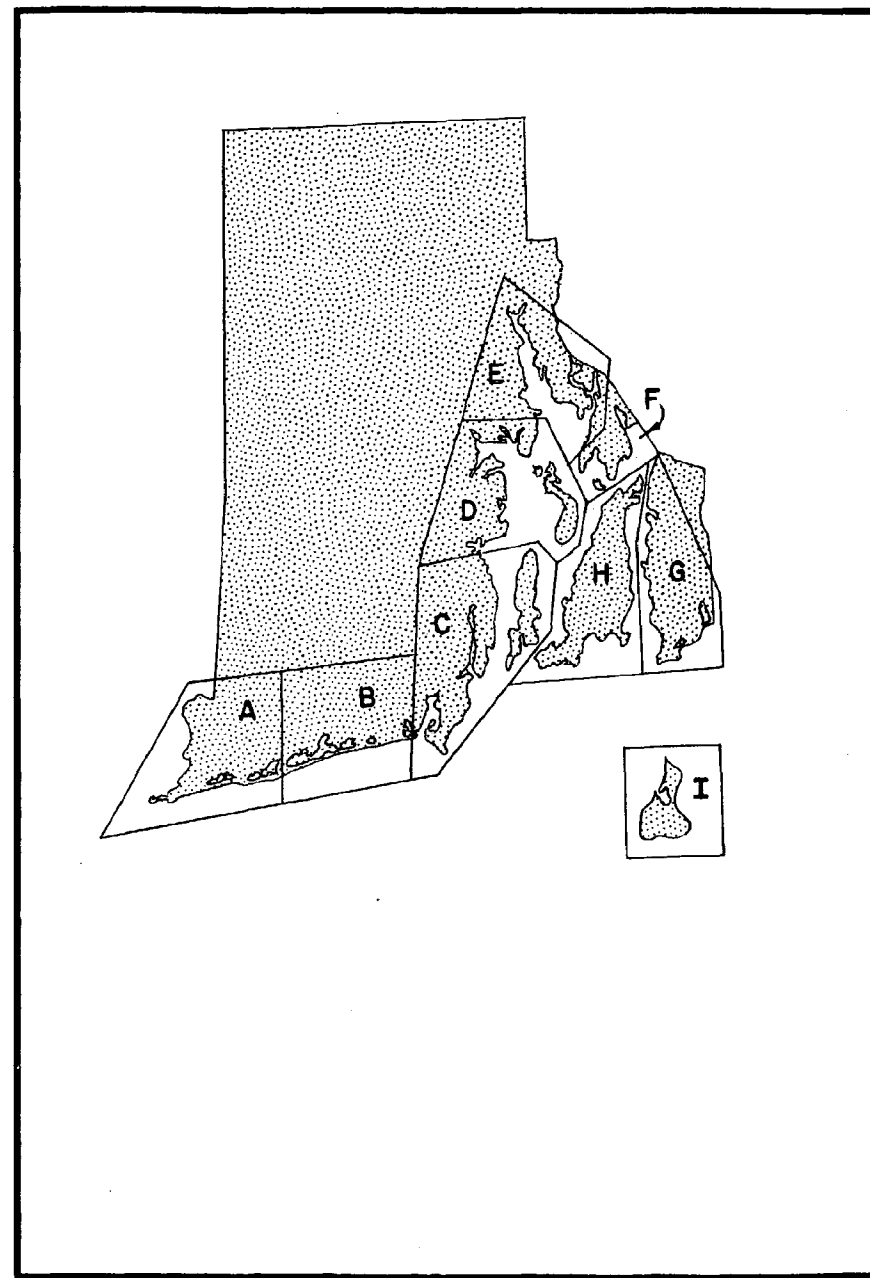


Salt marsh,  
less than 5 yards wide (fringe)

Map Scale 1:12,000



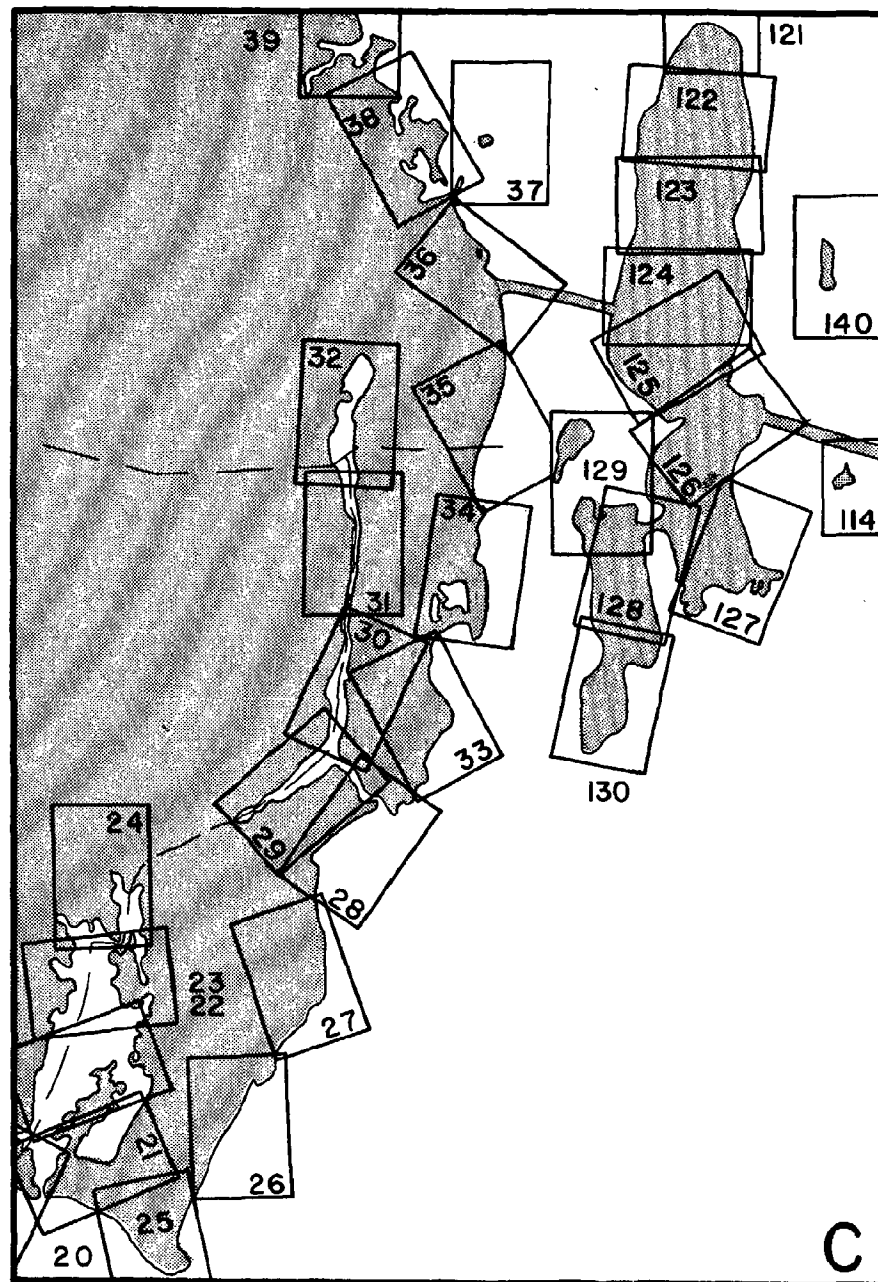
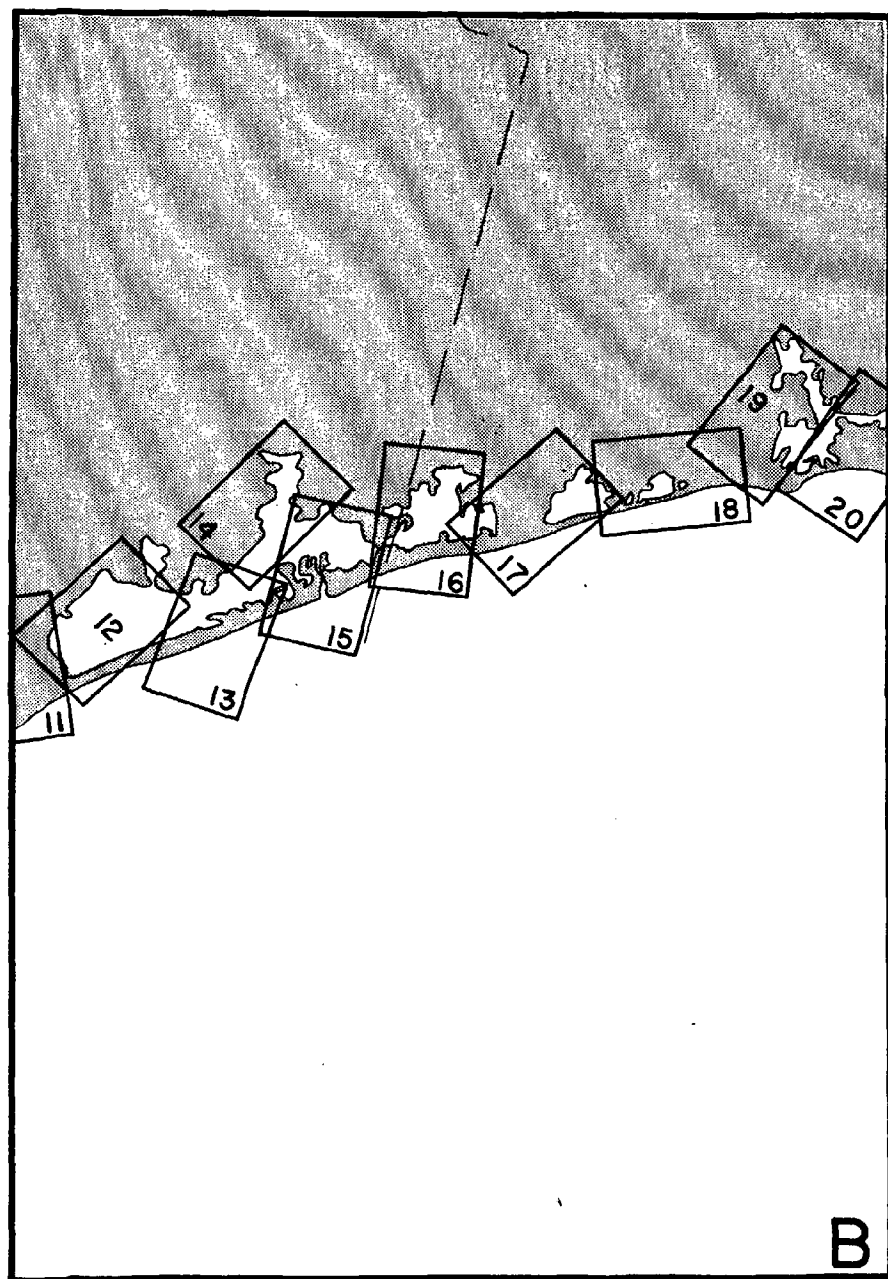
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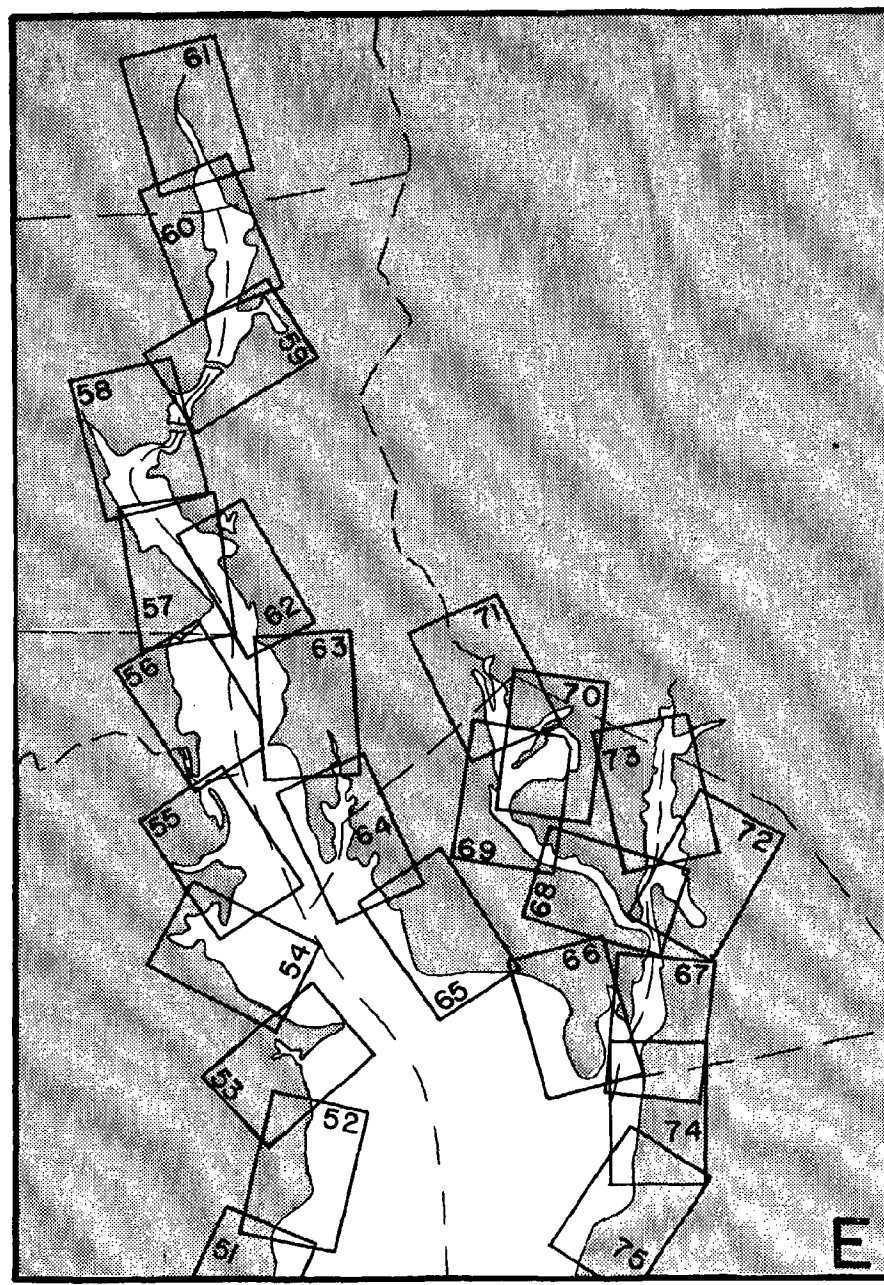
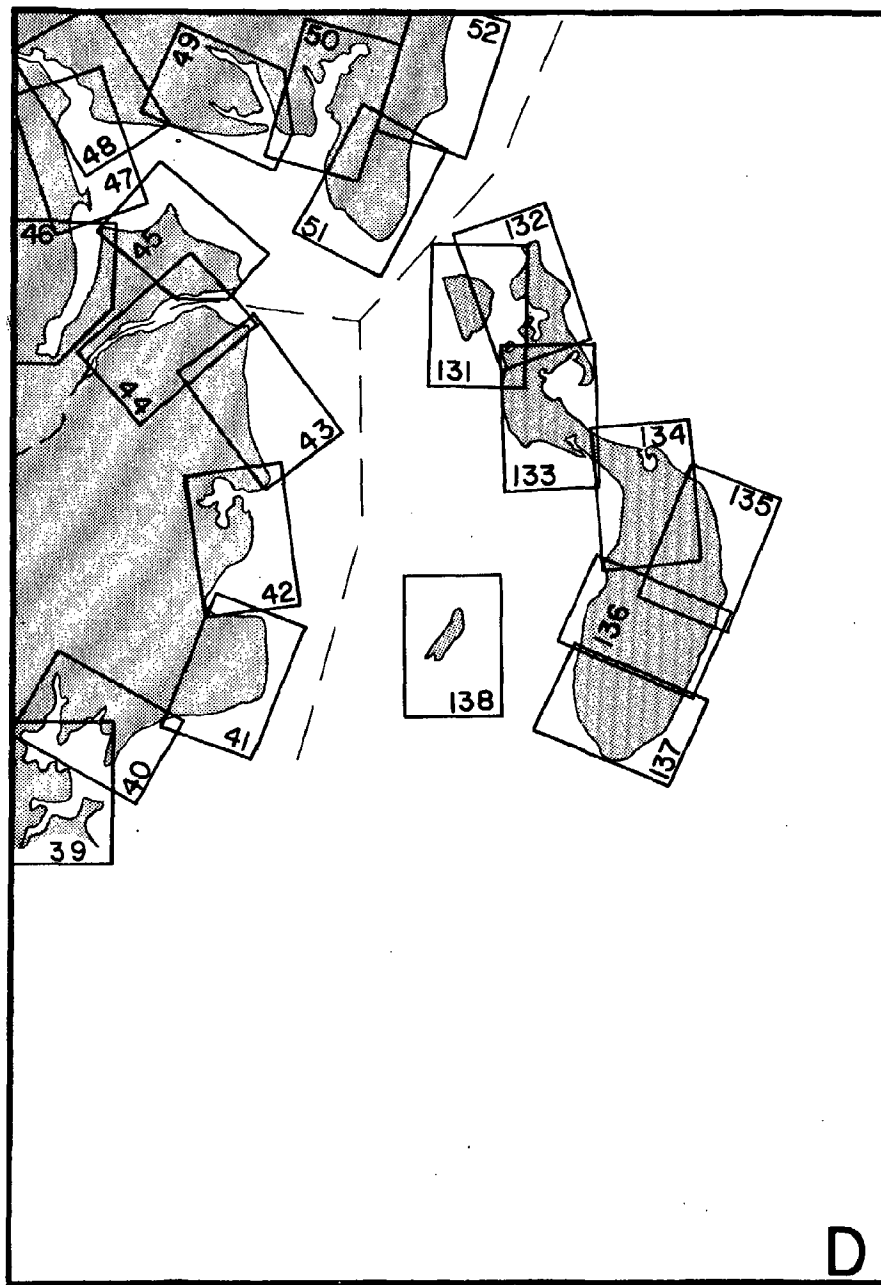


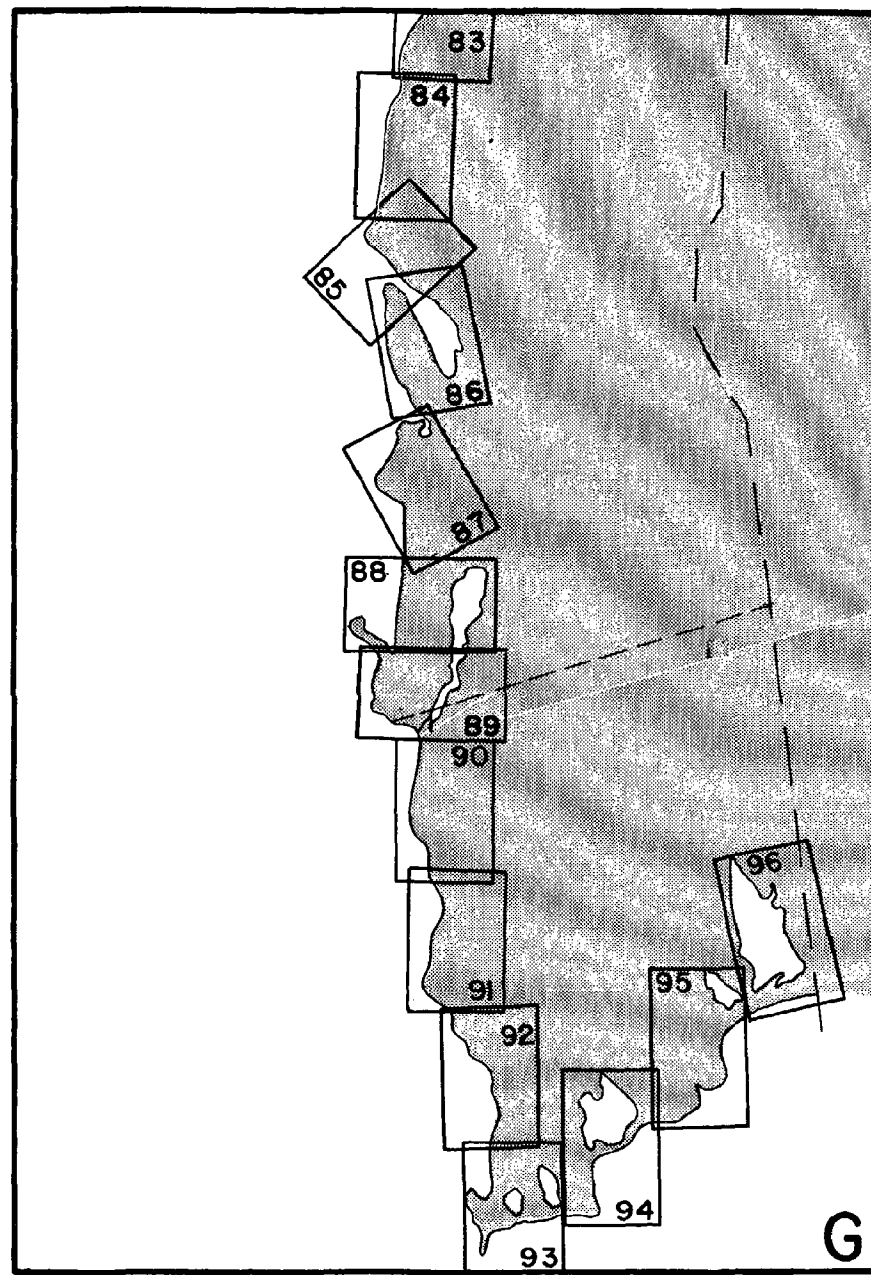
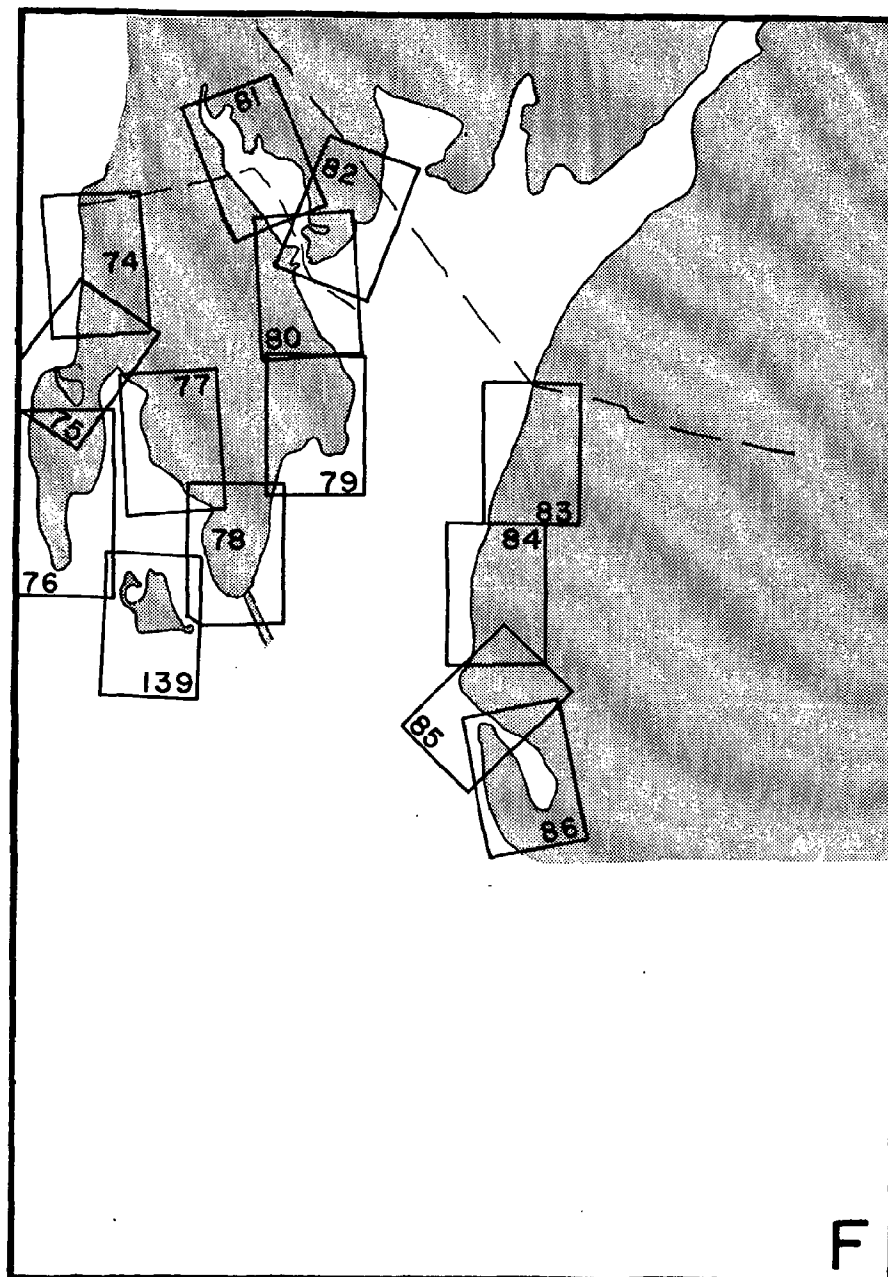
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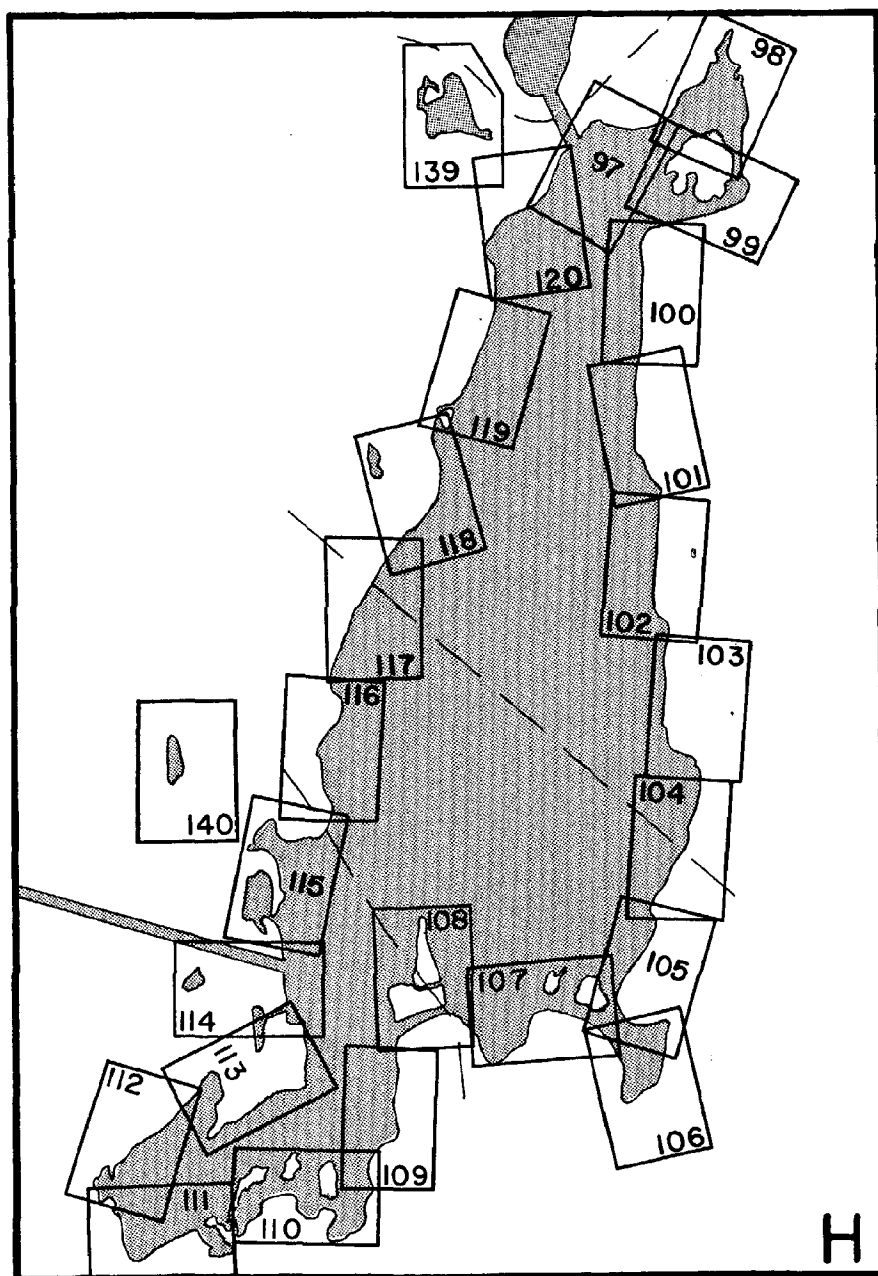




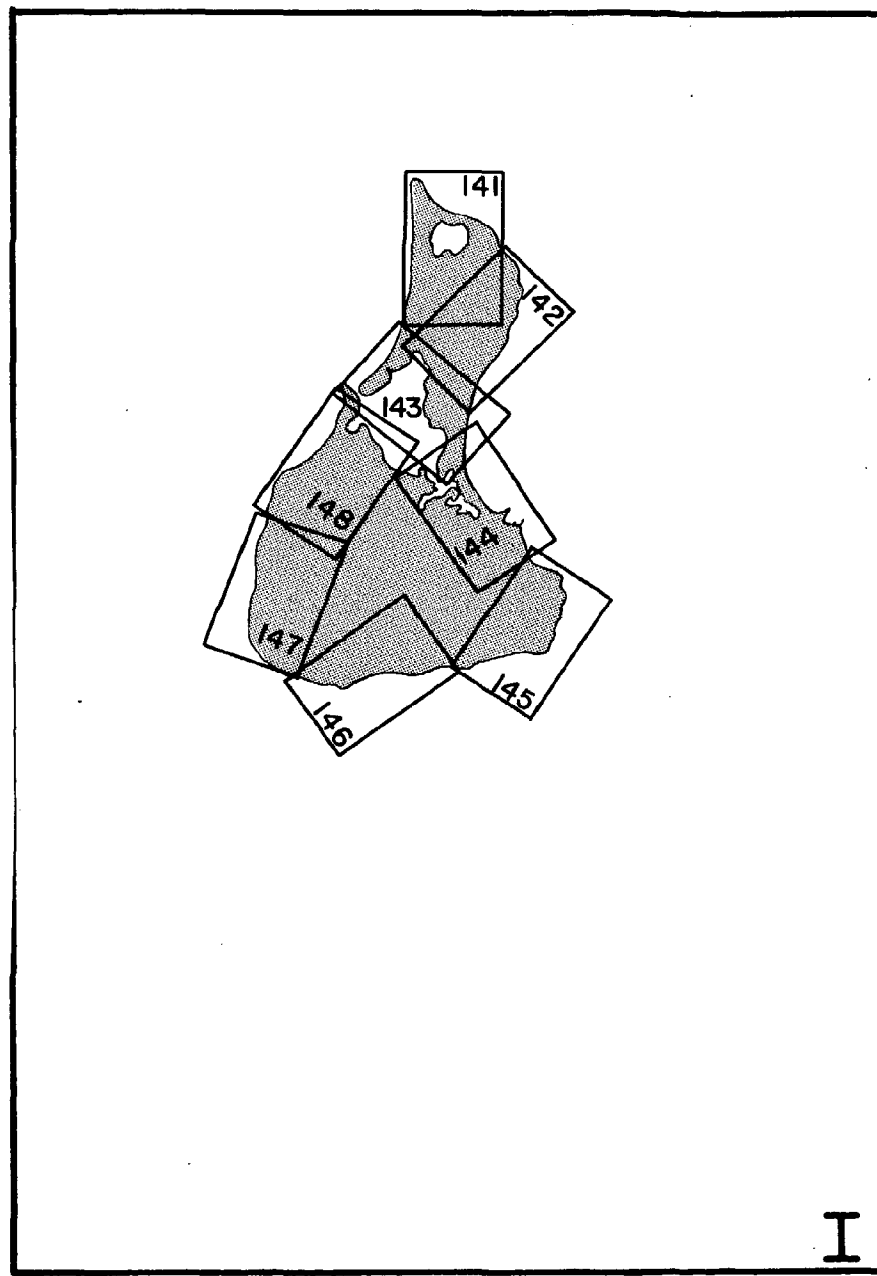






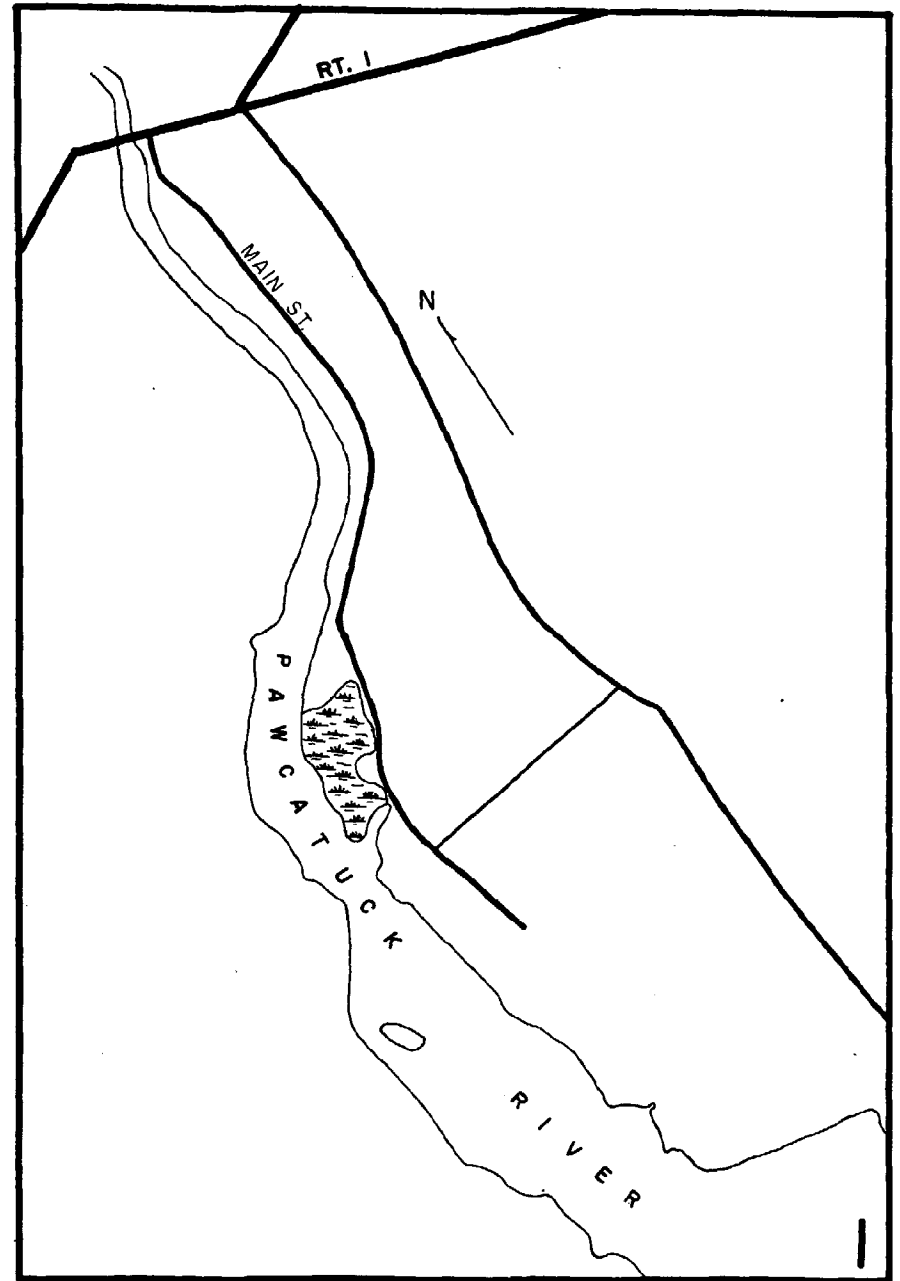


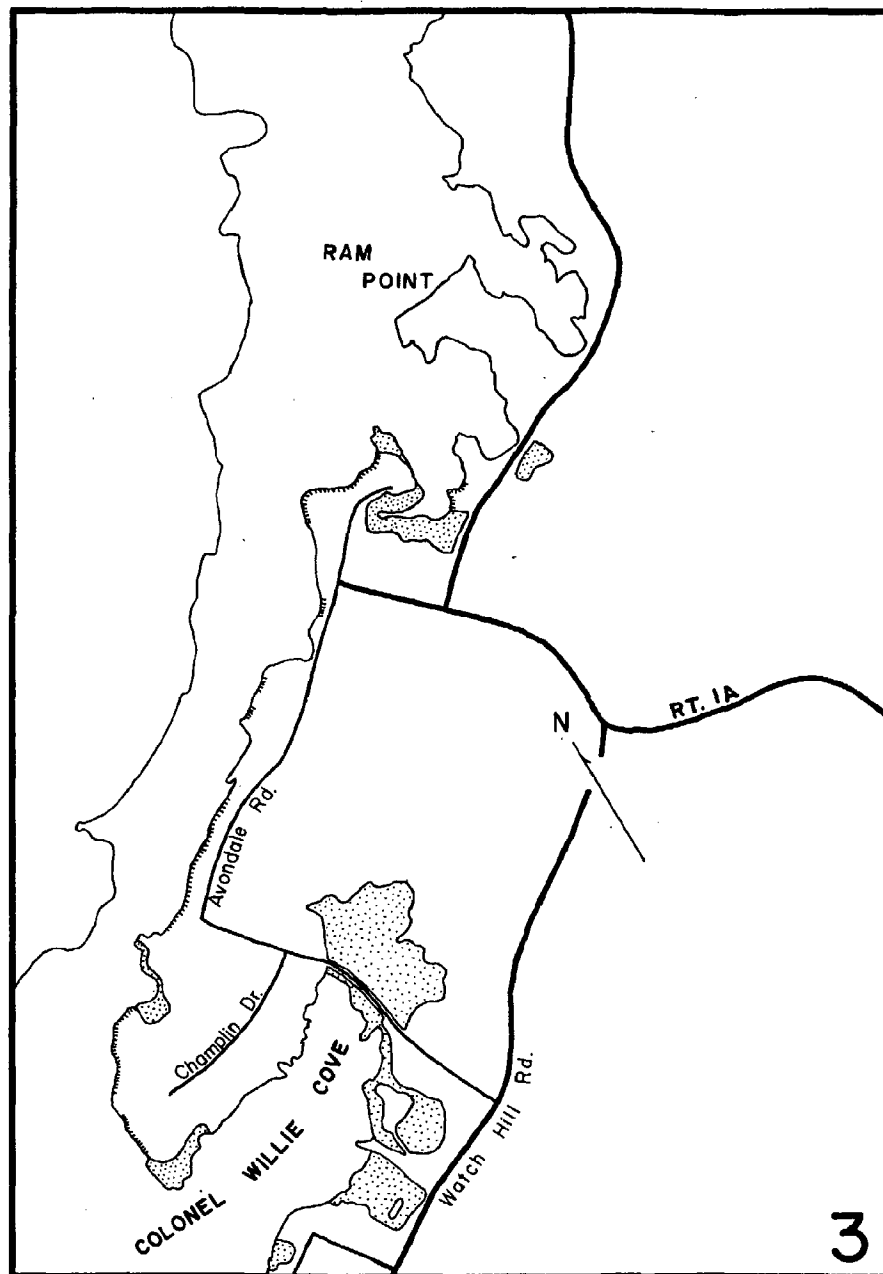
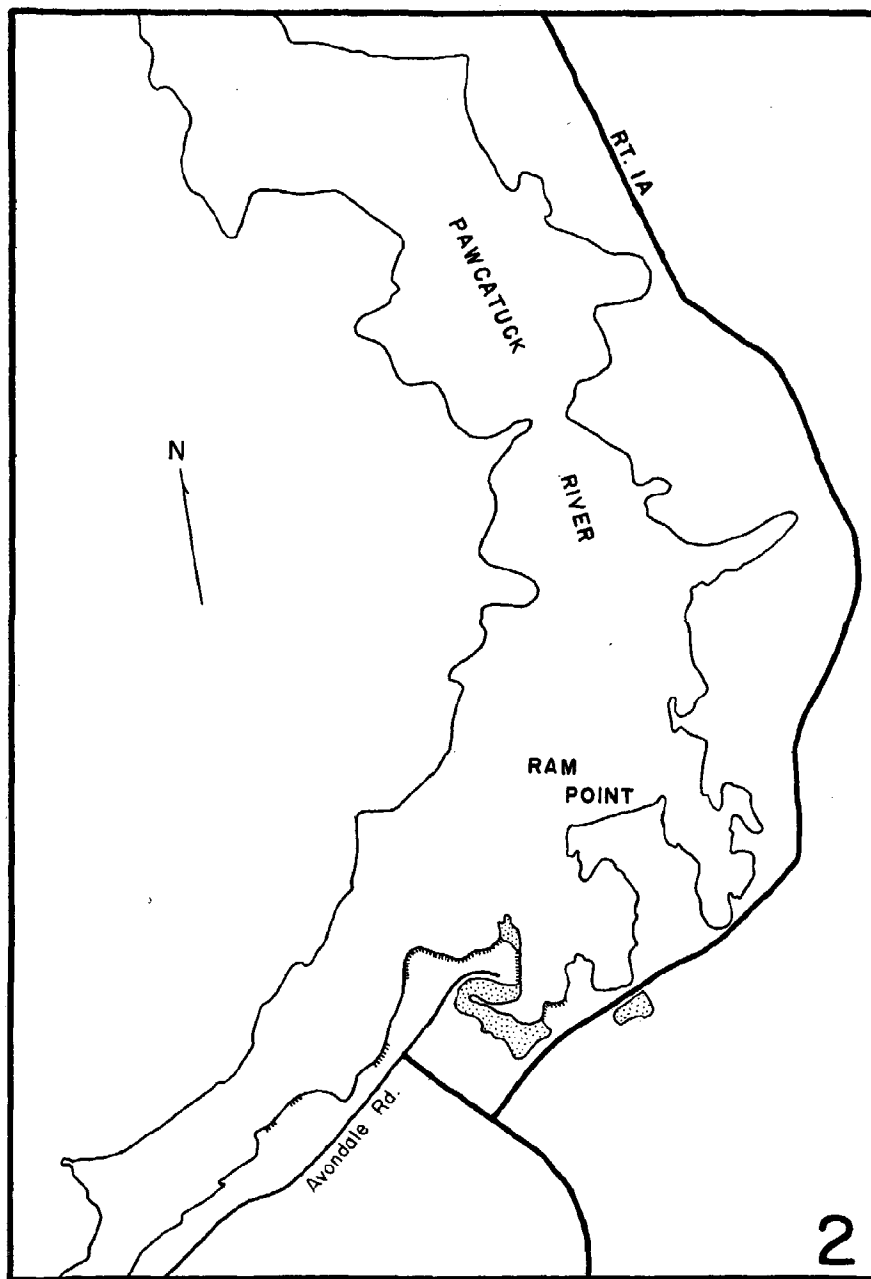
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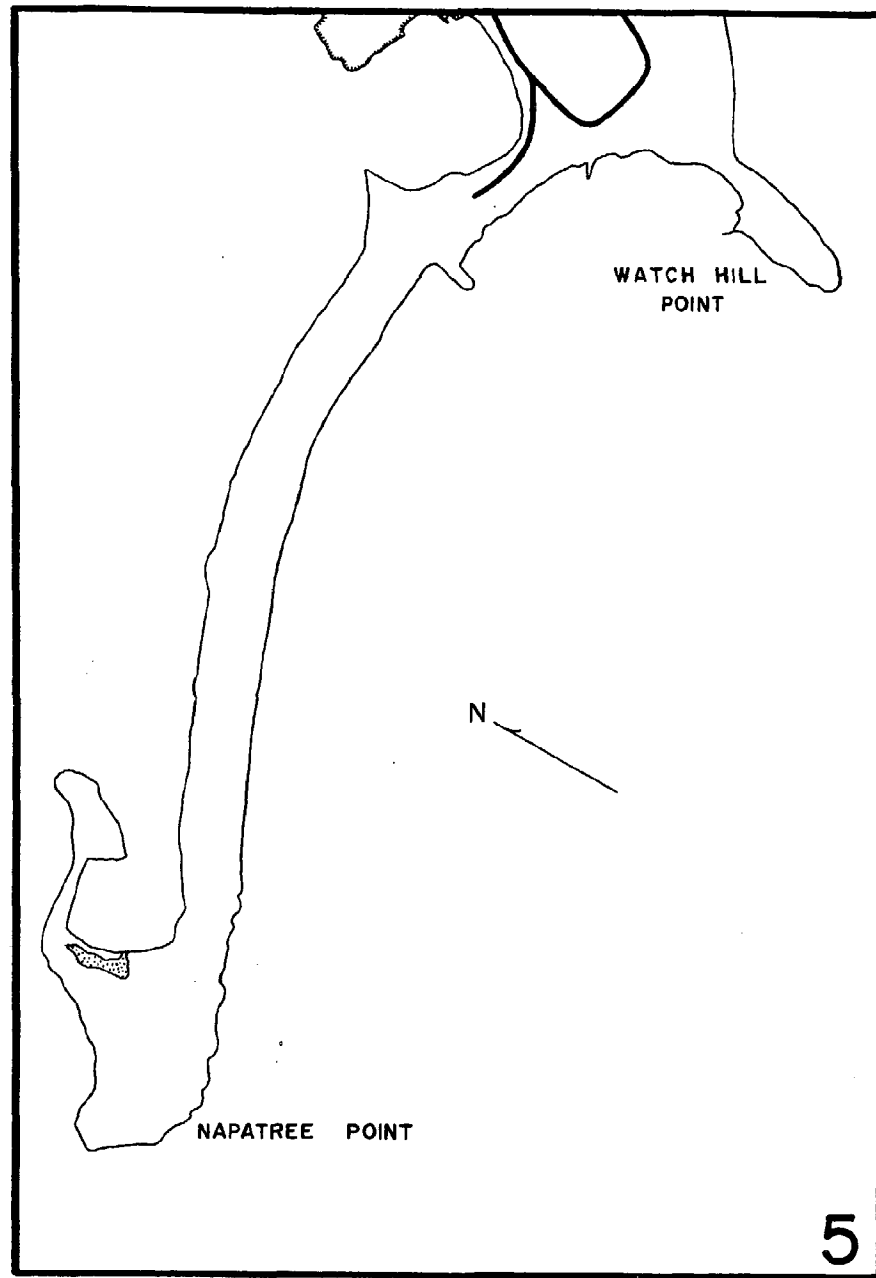
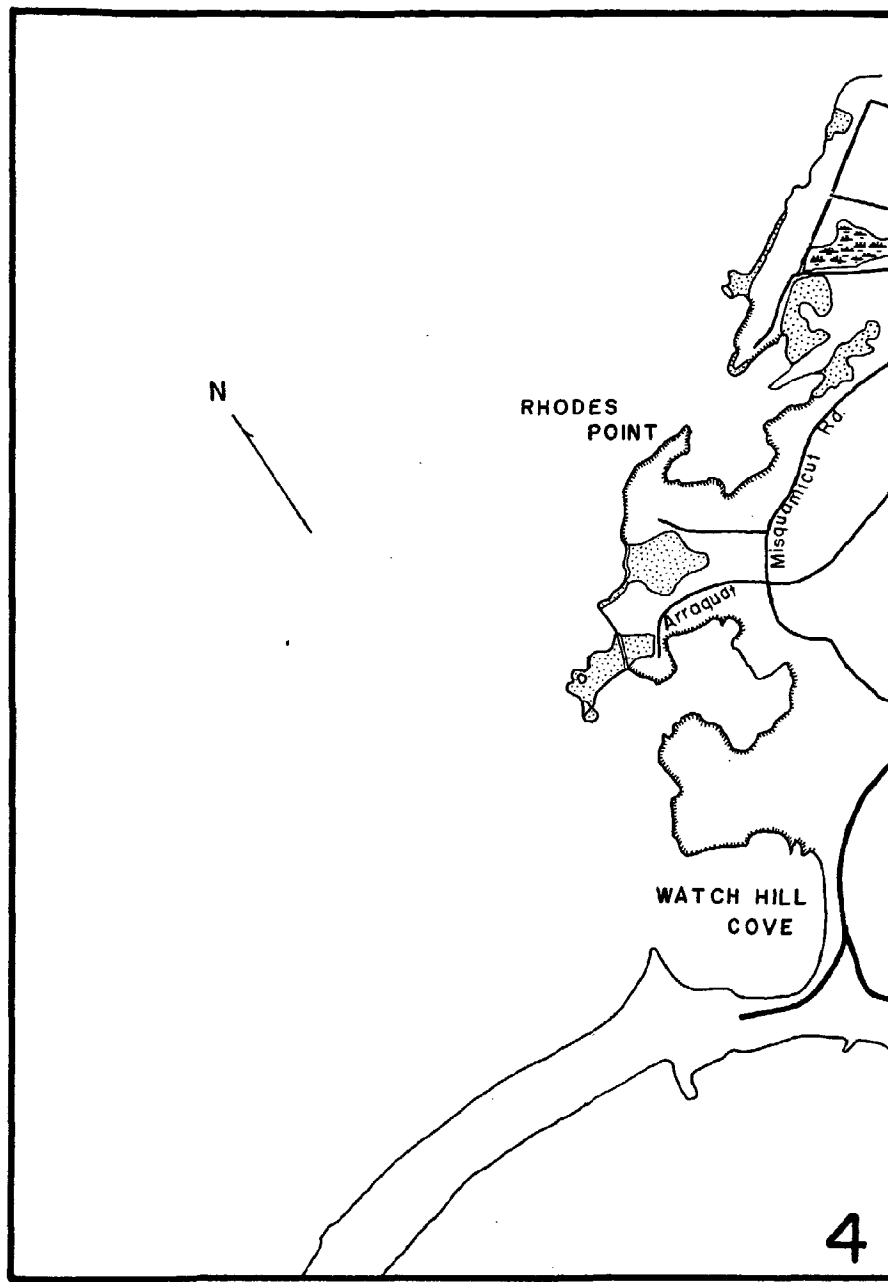


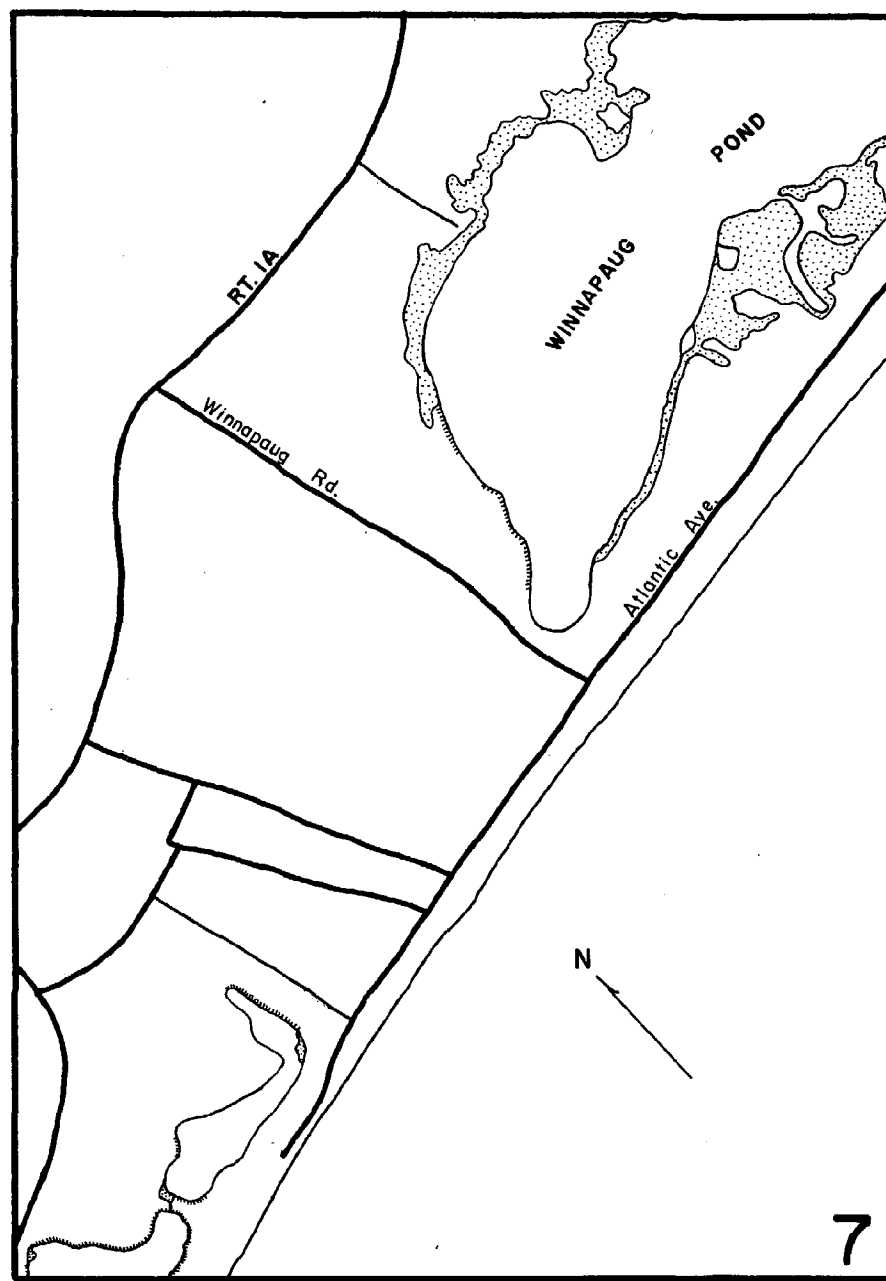
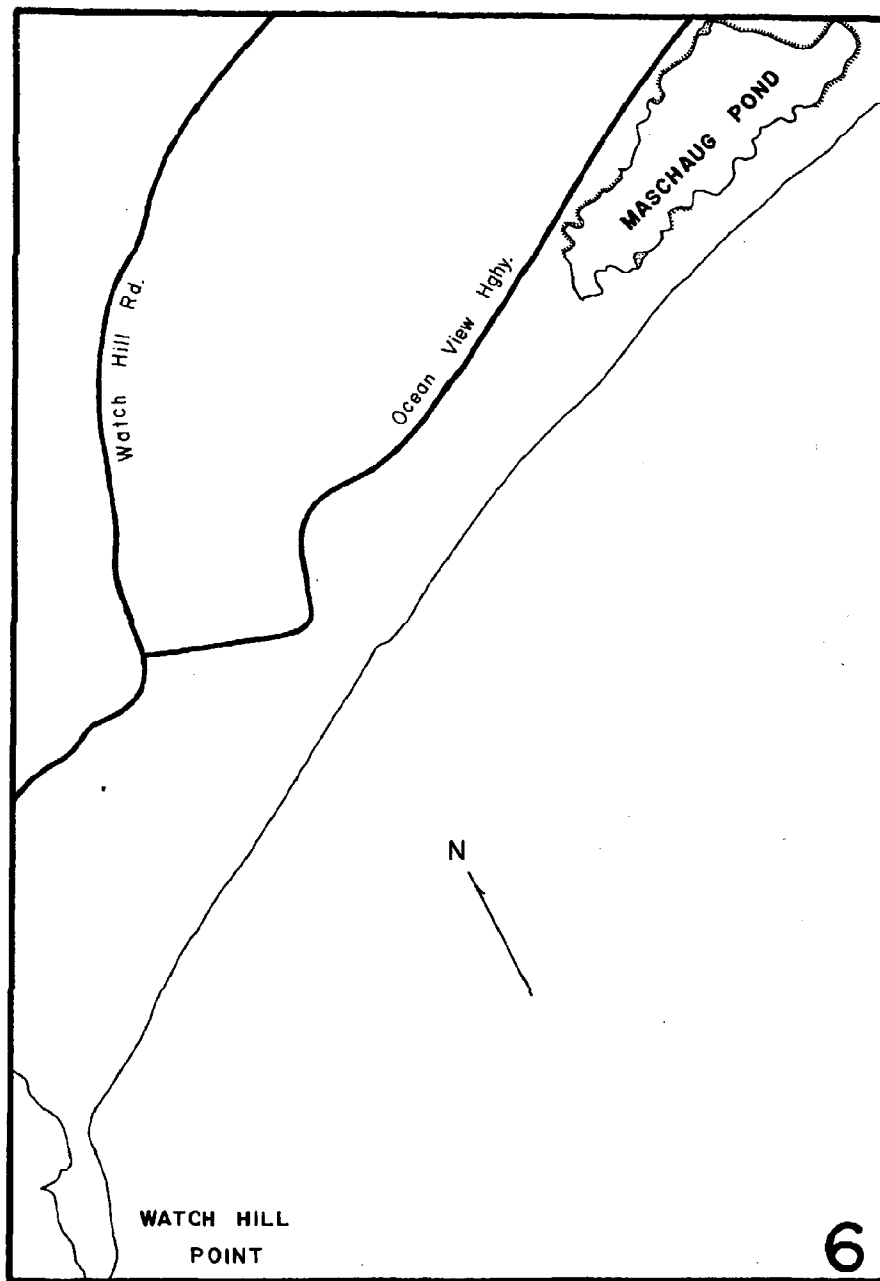
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# Inventory Maps

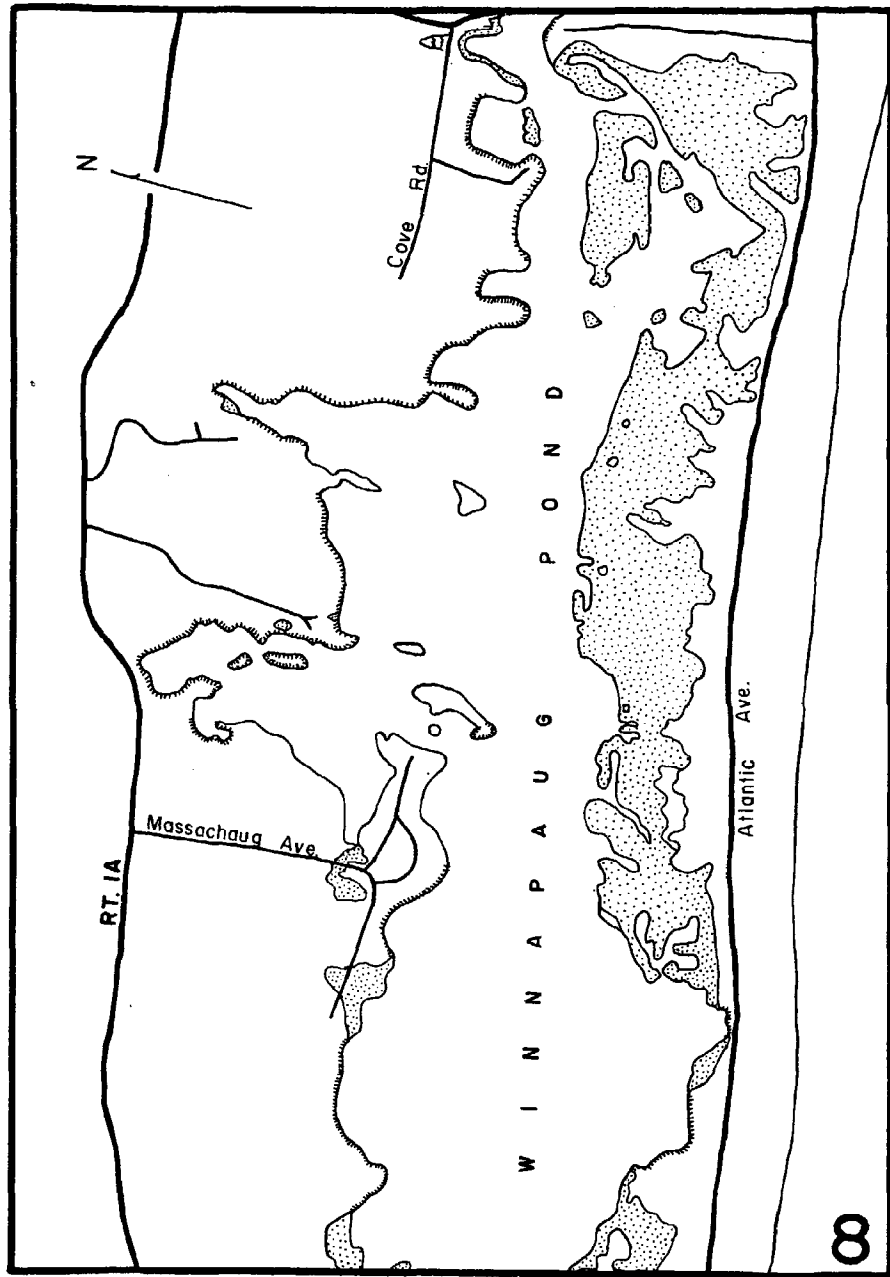


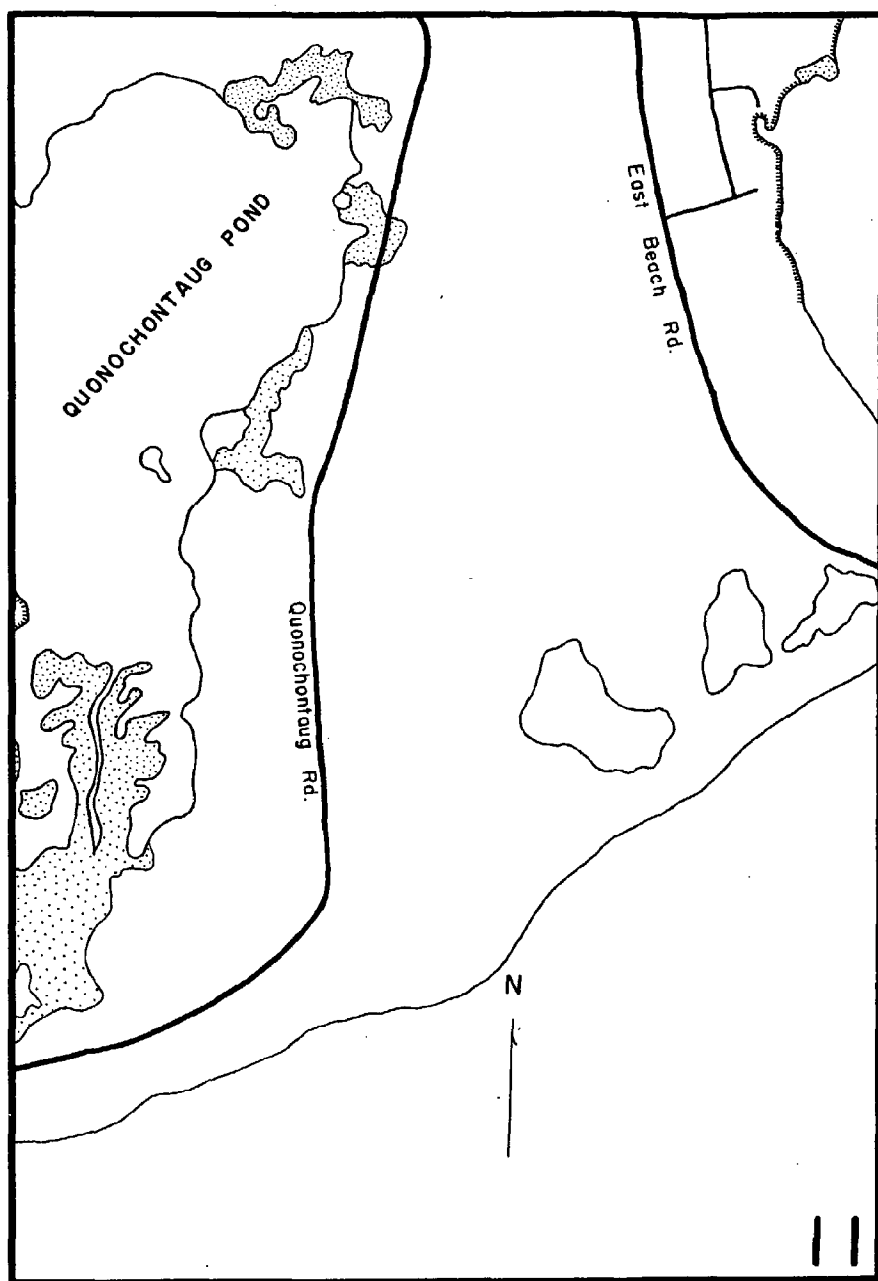
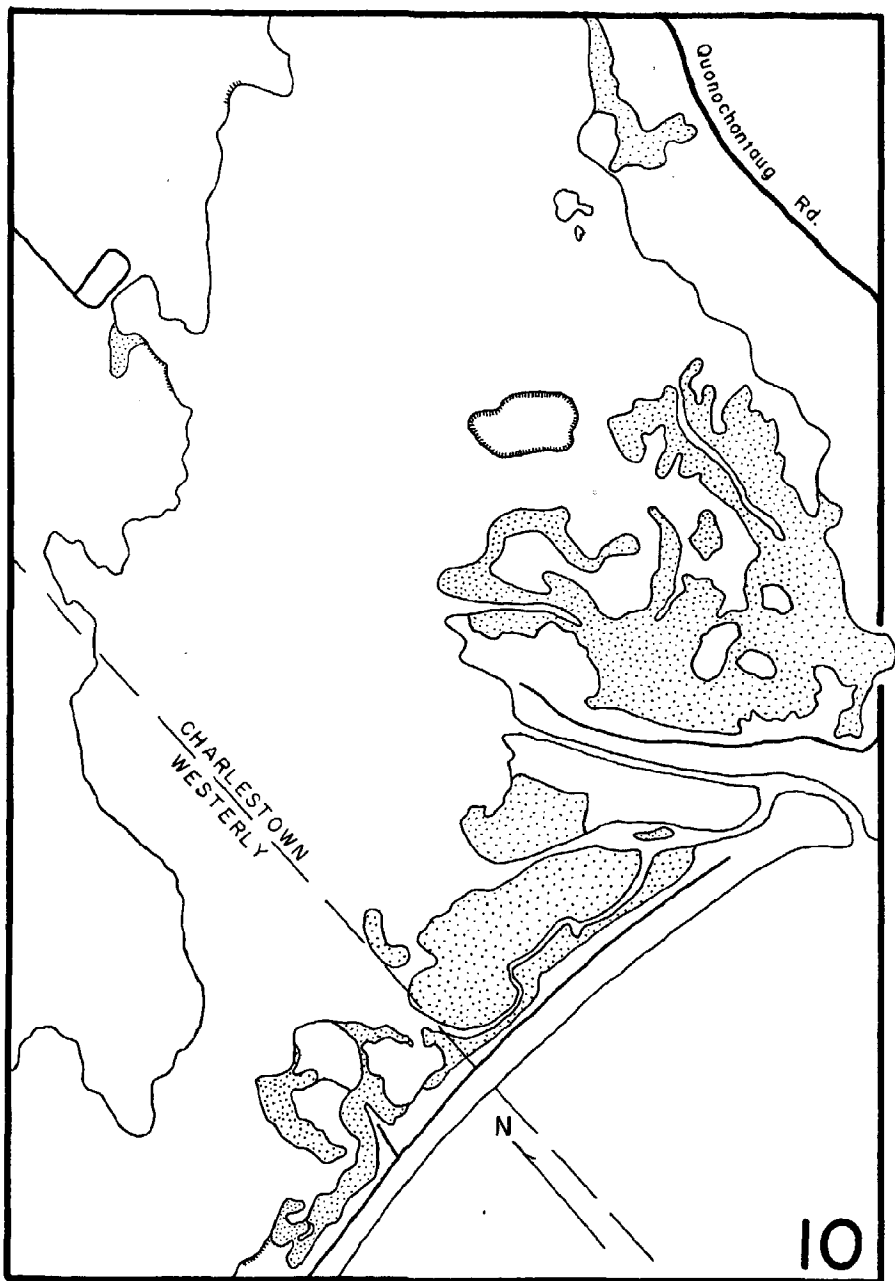


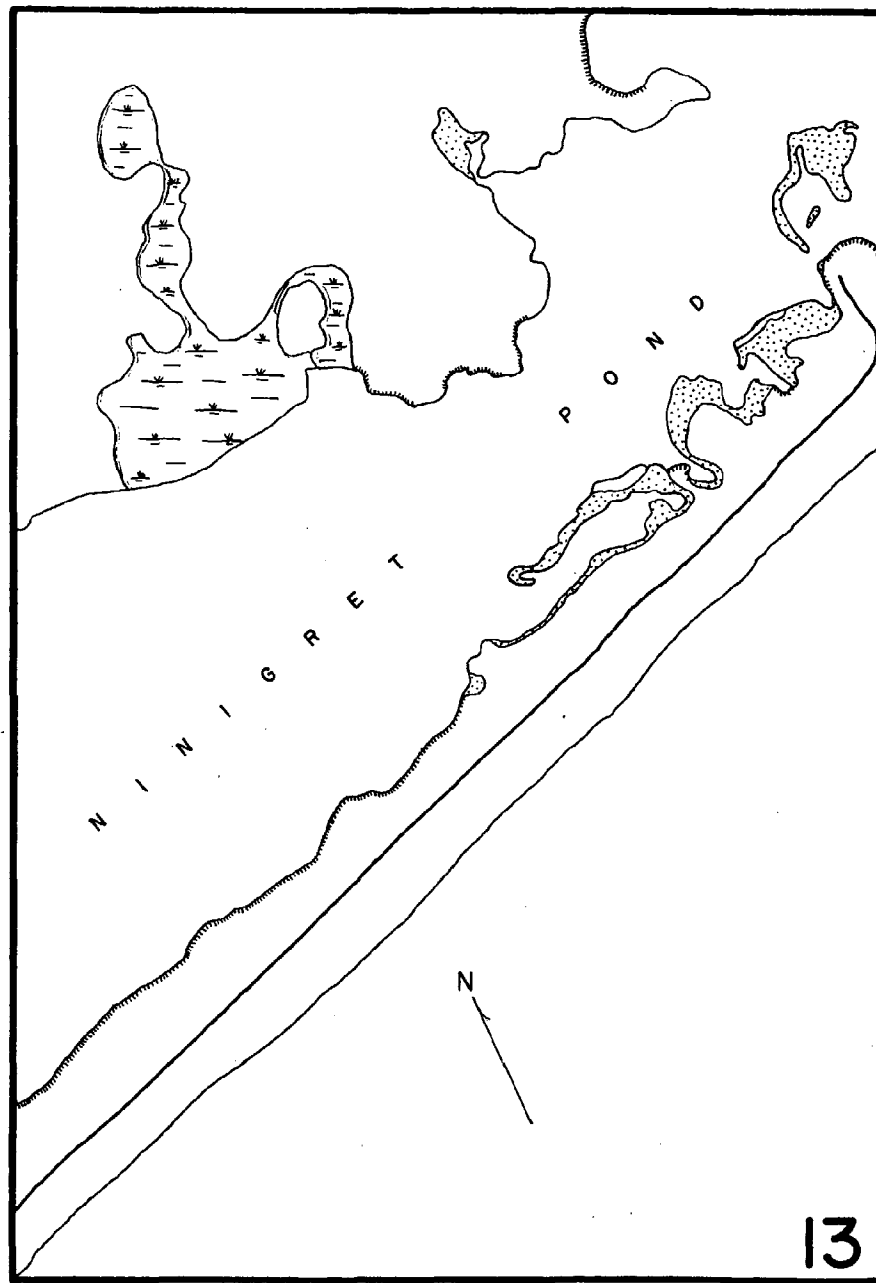
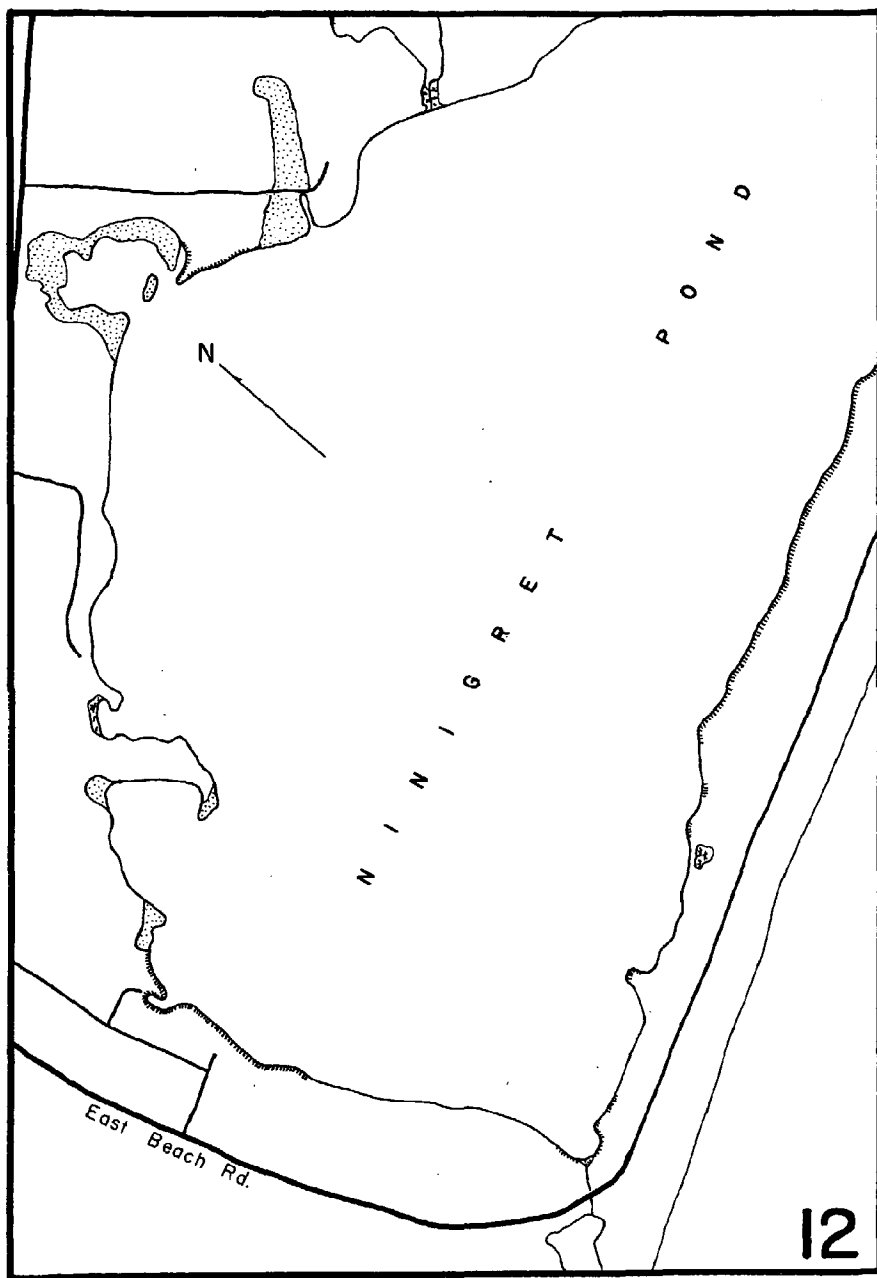


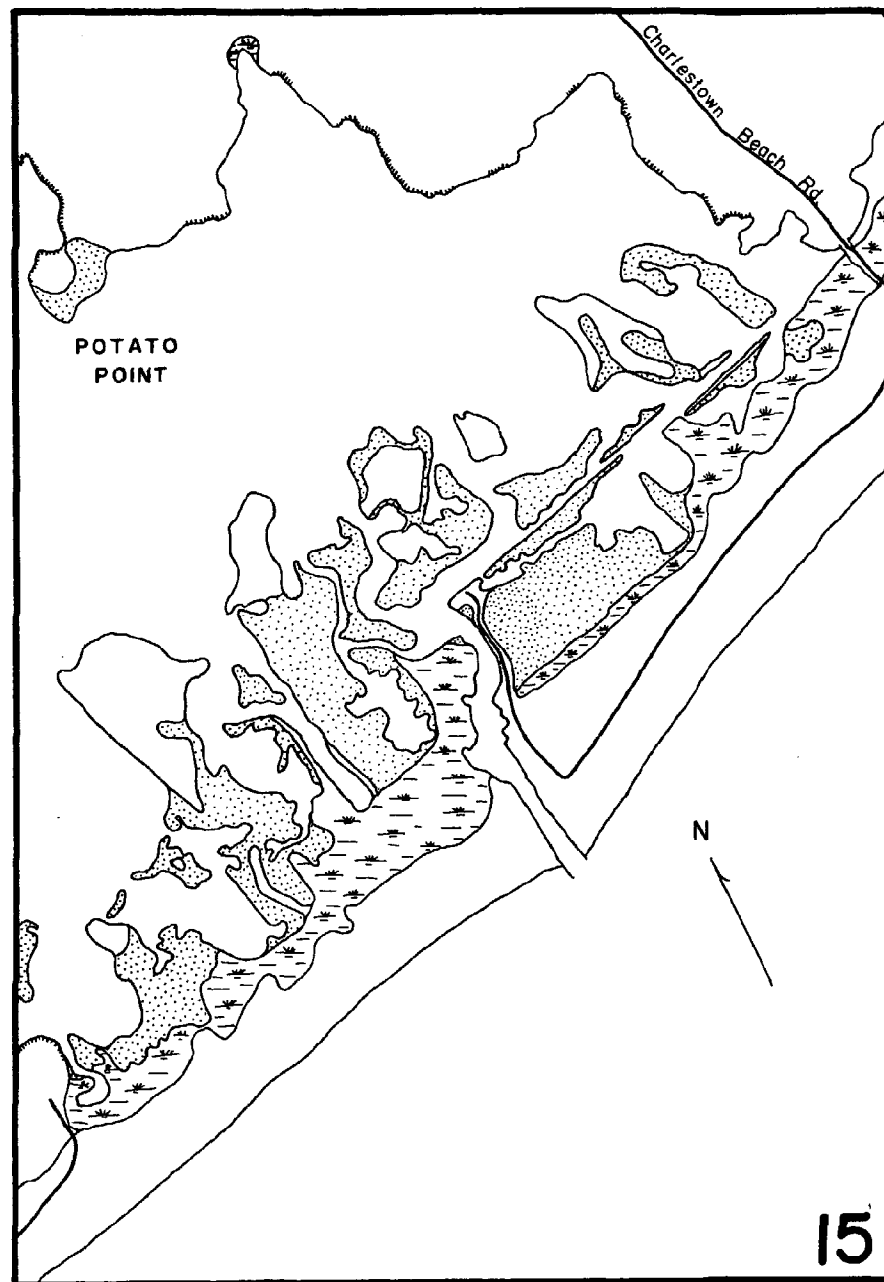
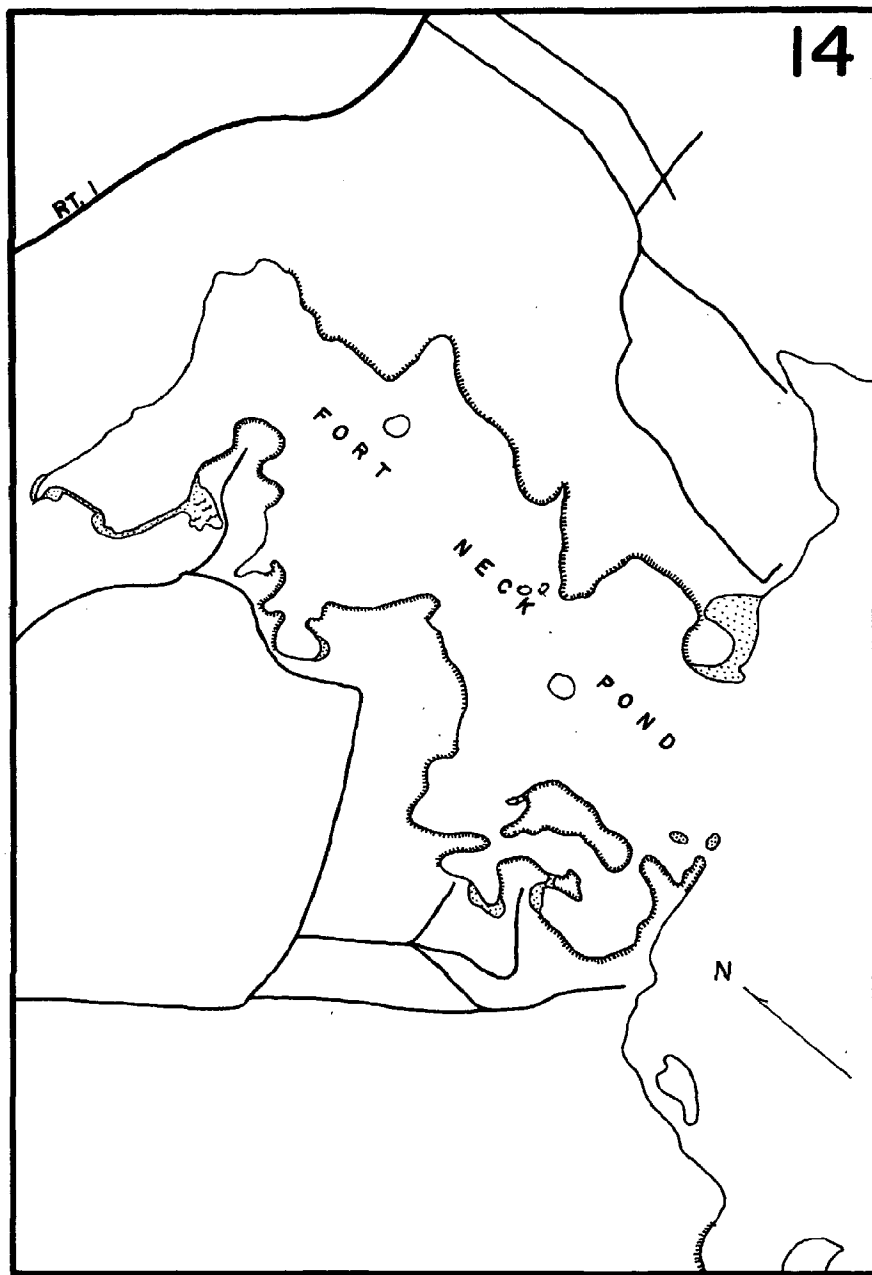


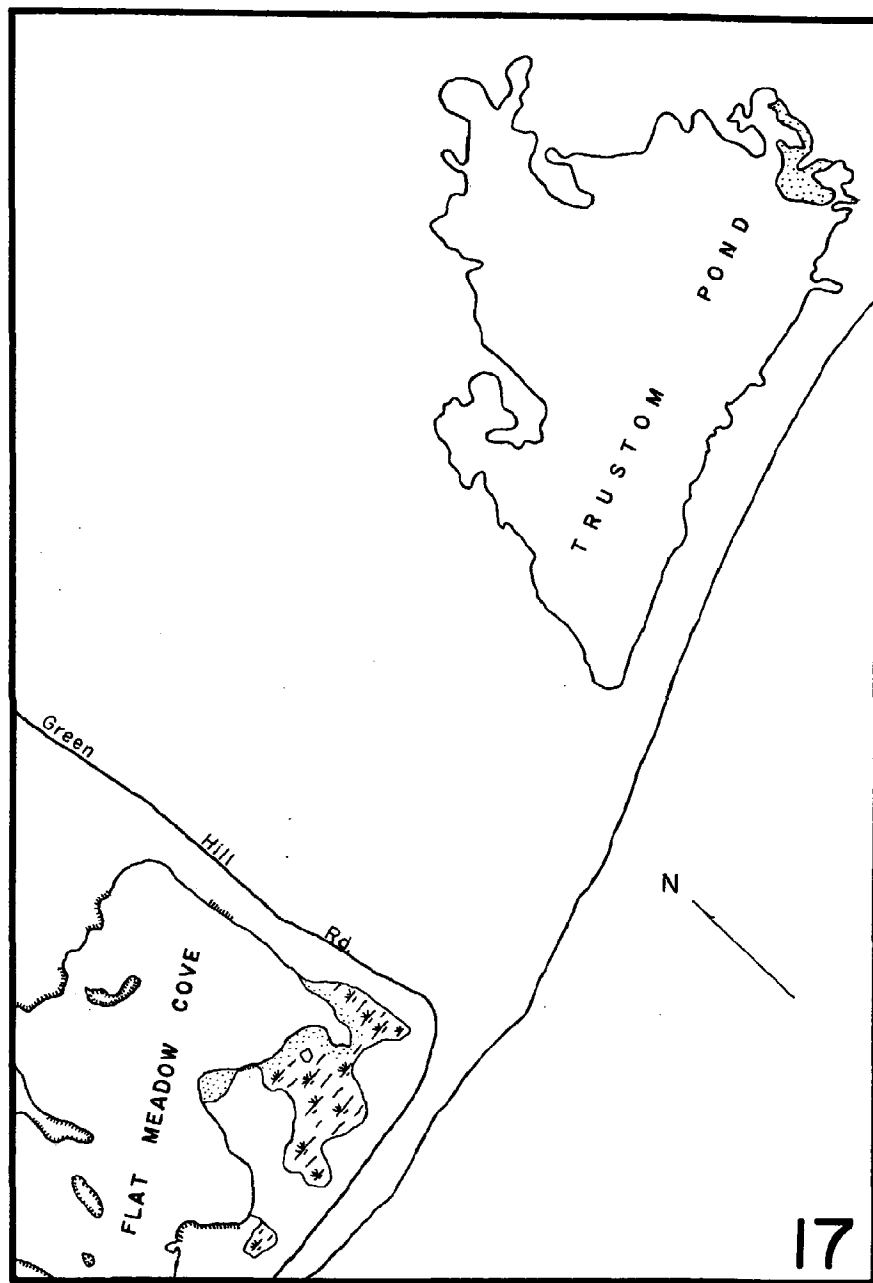
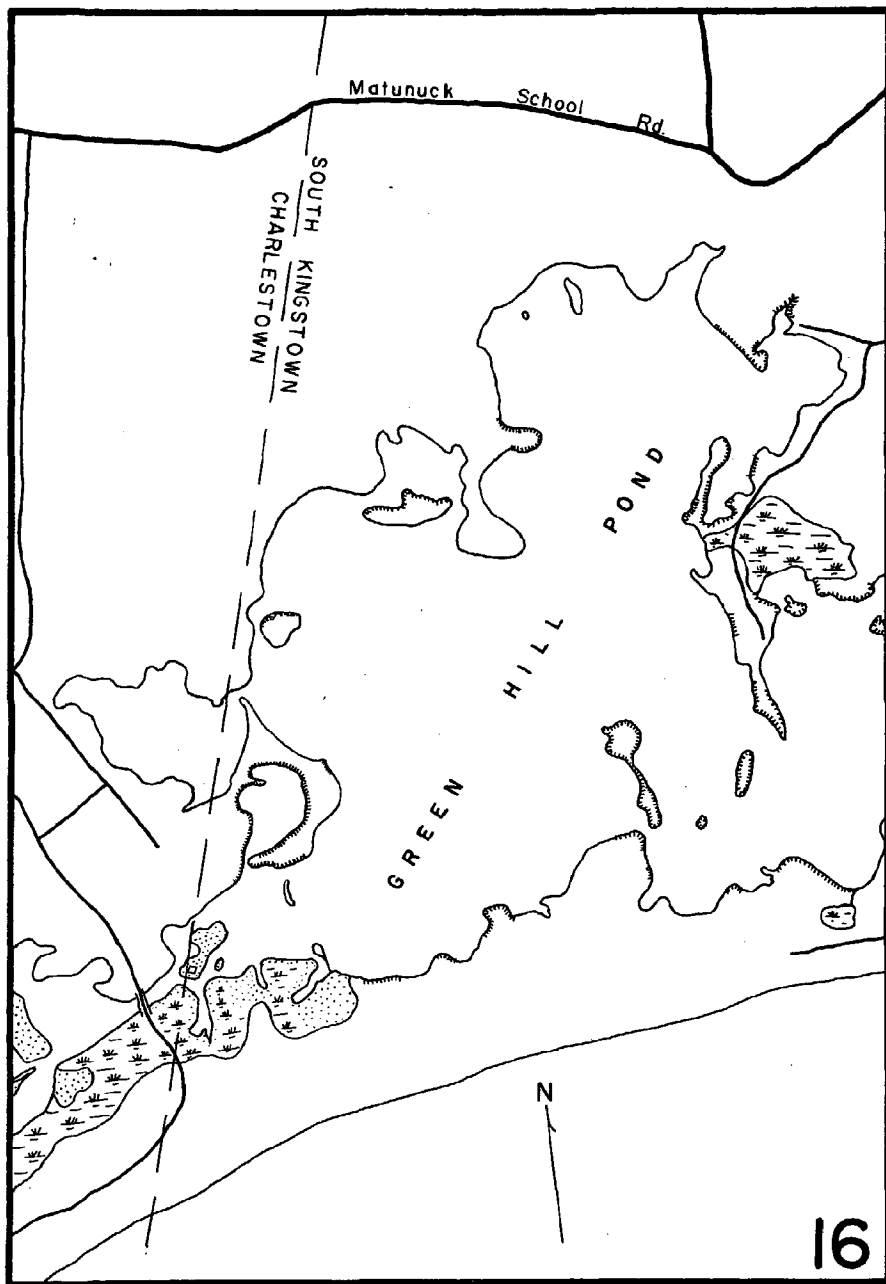


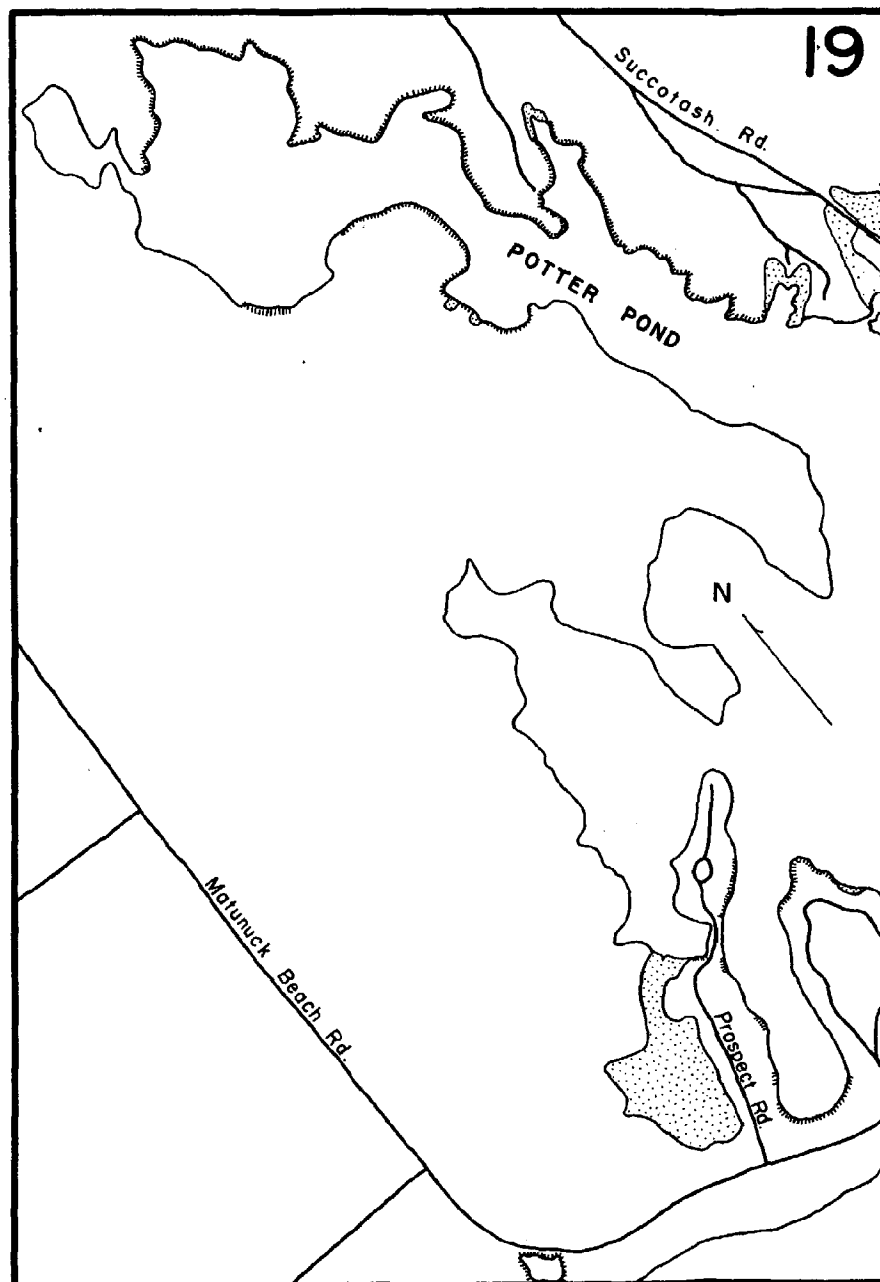
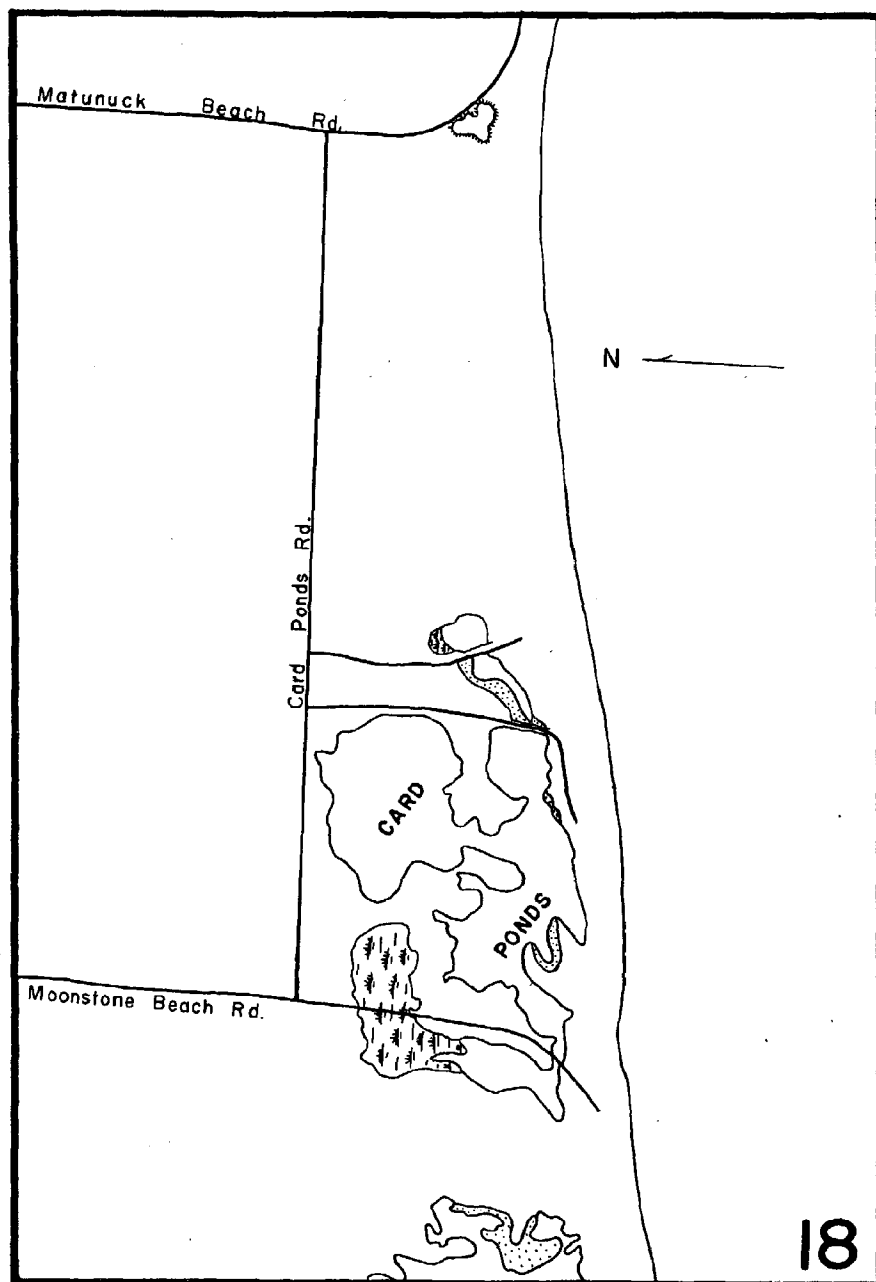


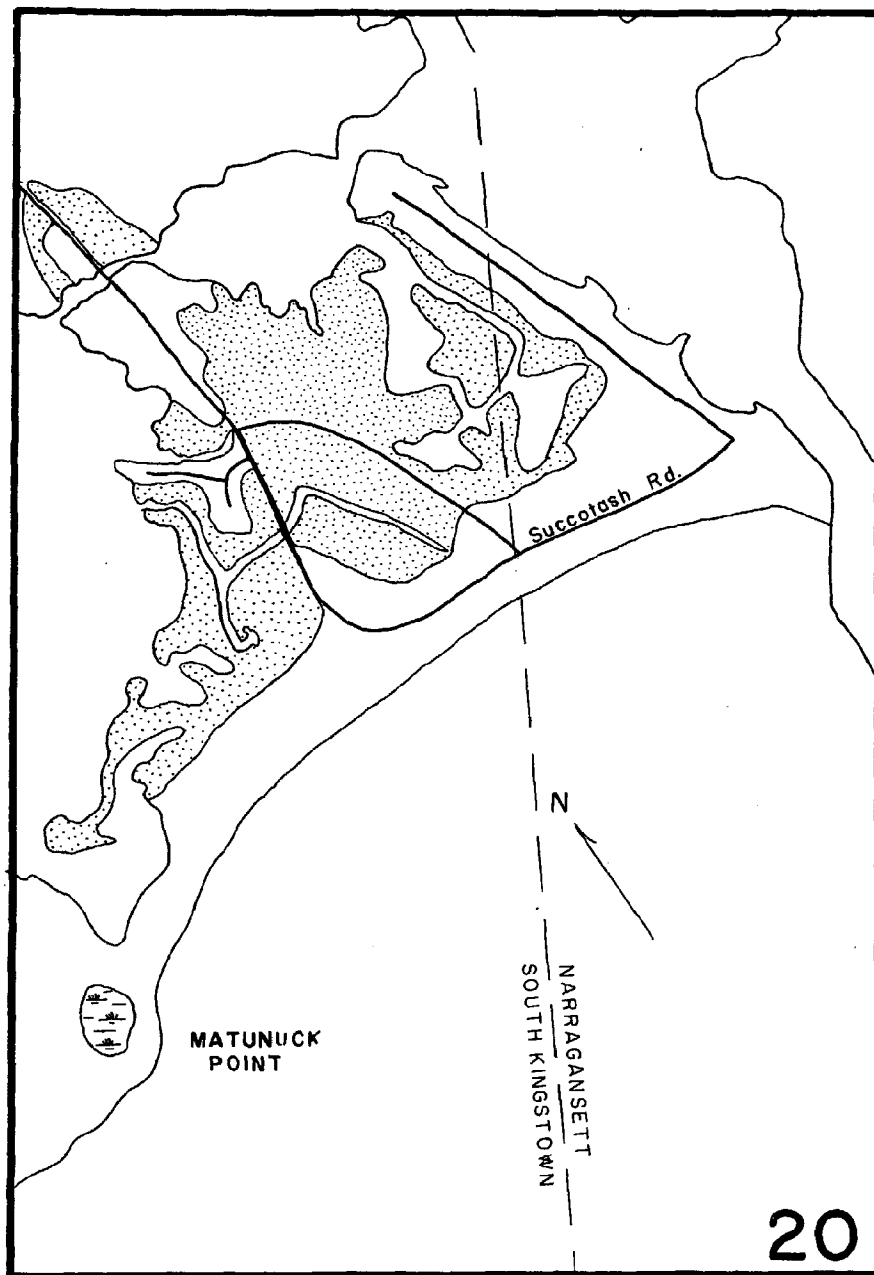


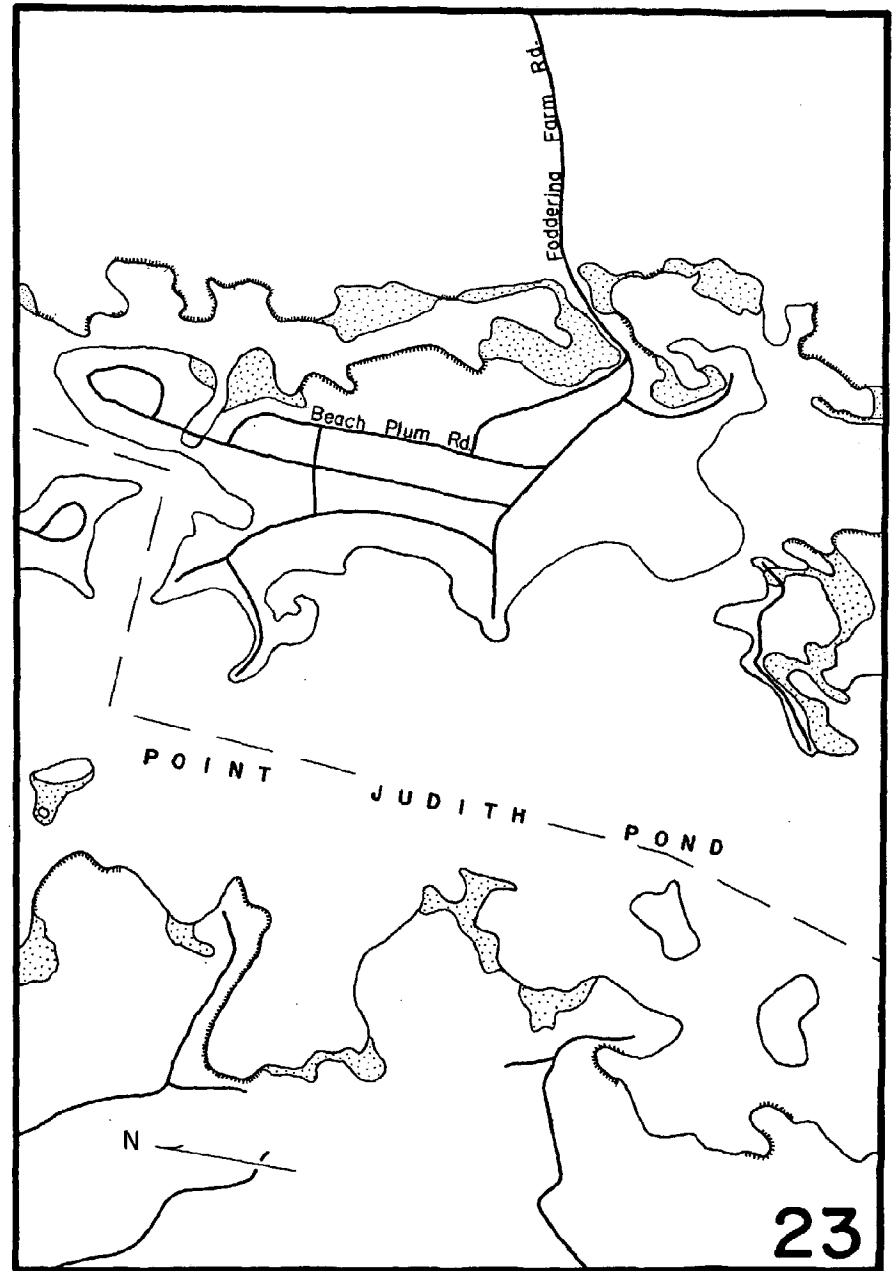
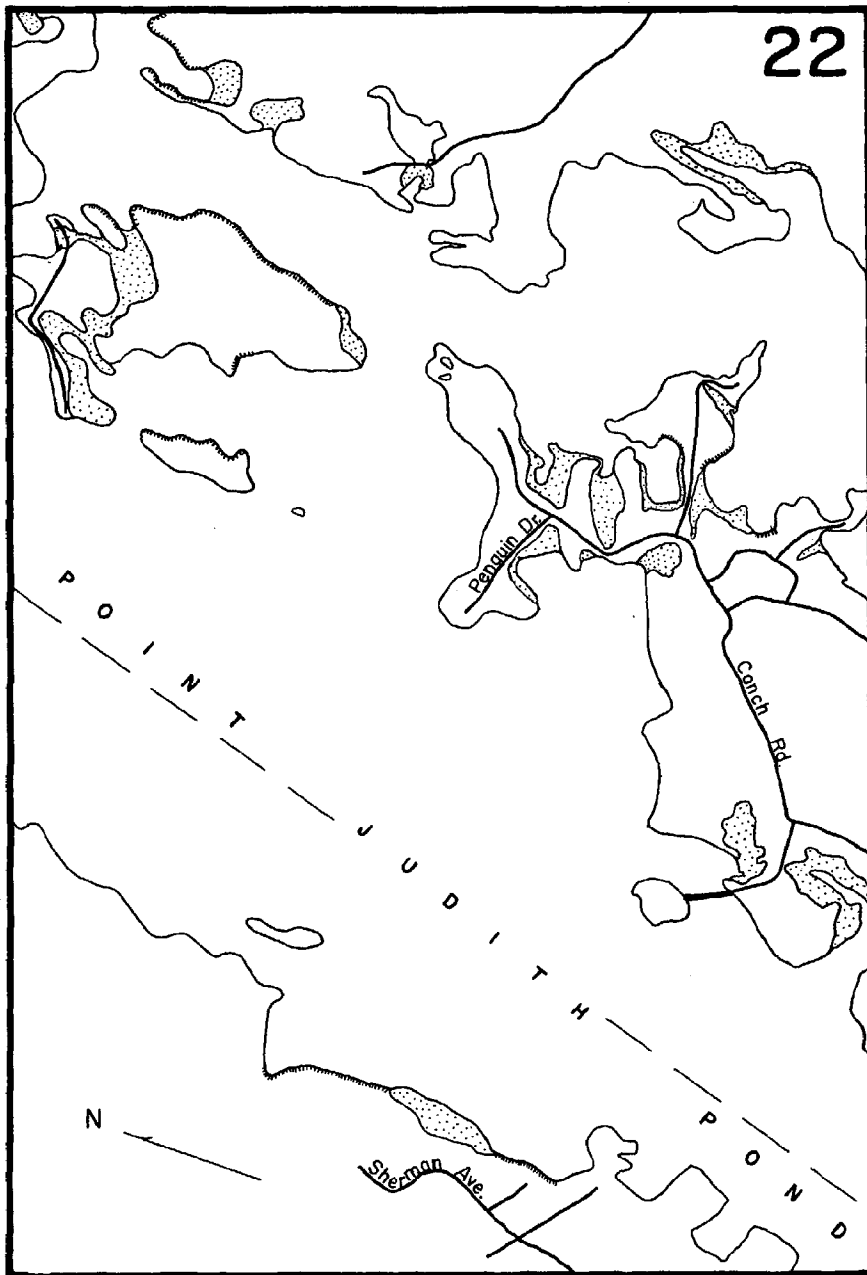




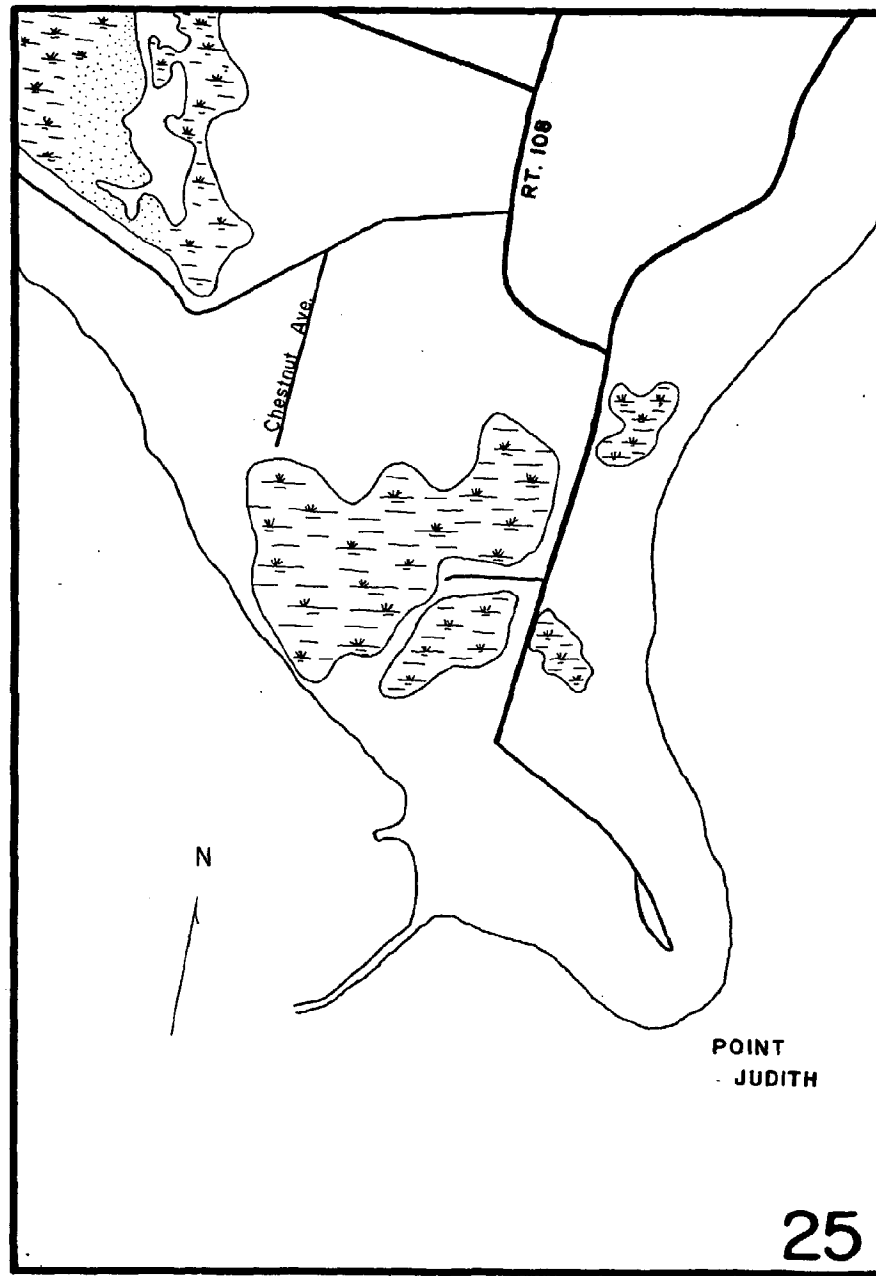
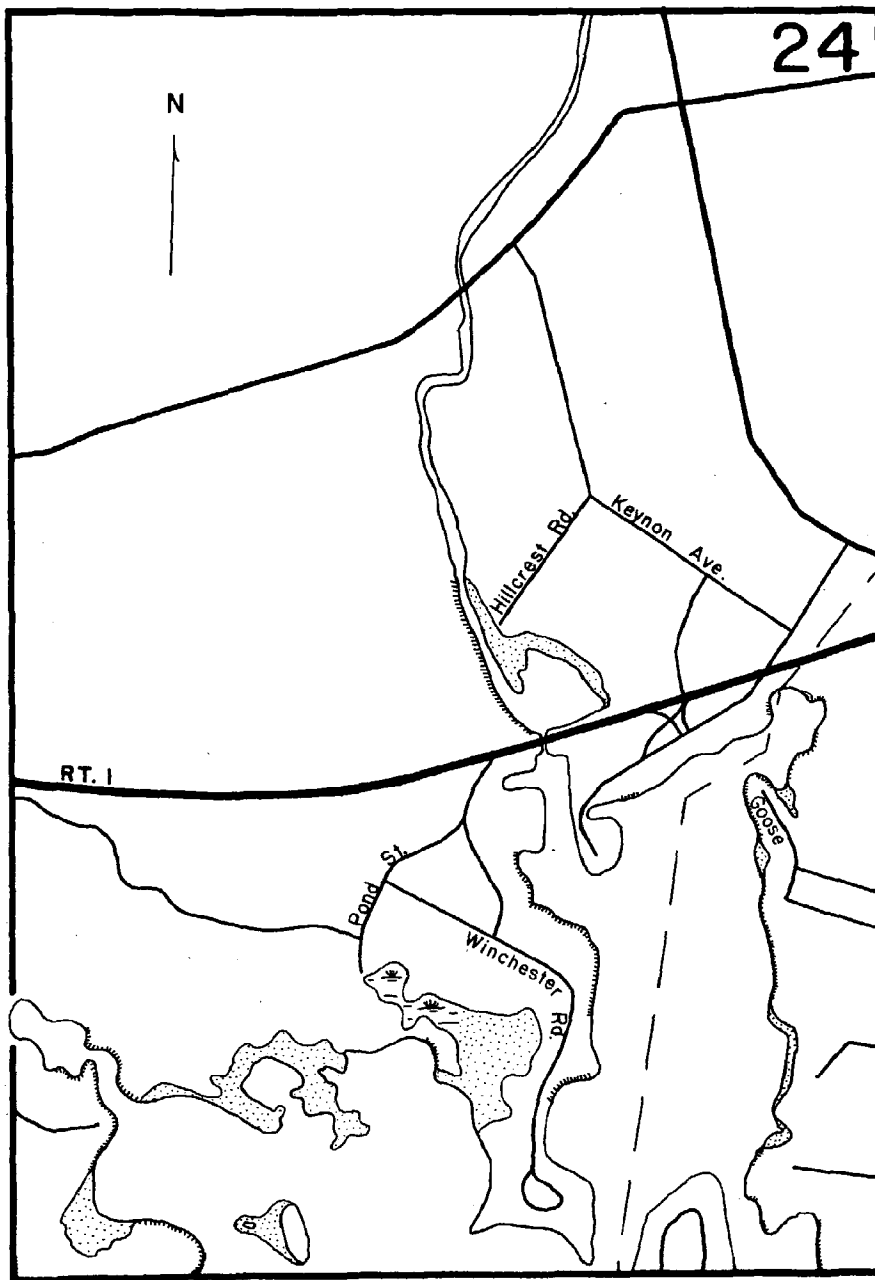


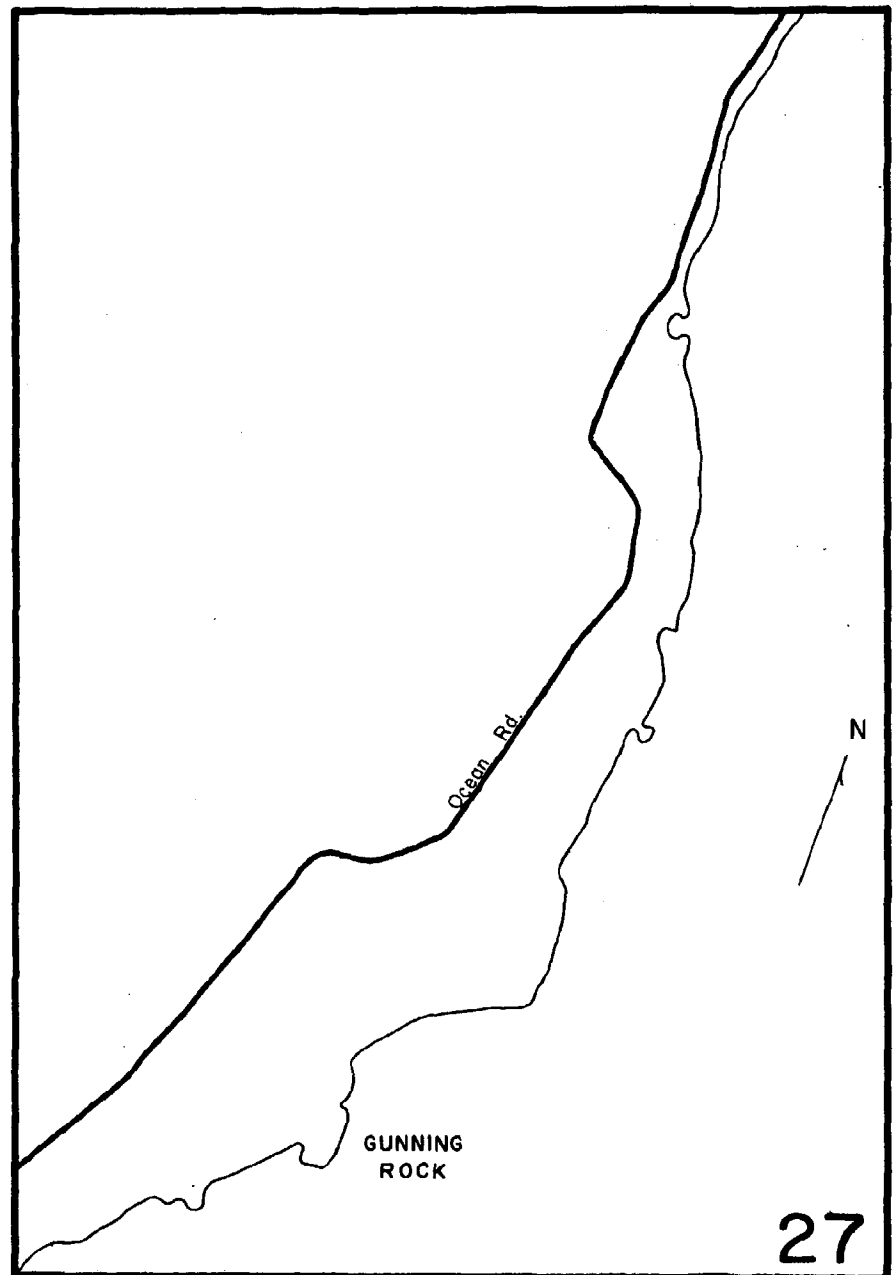
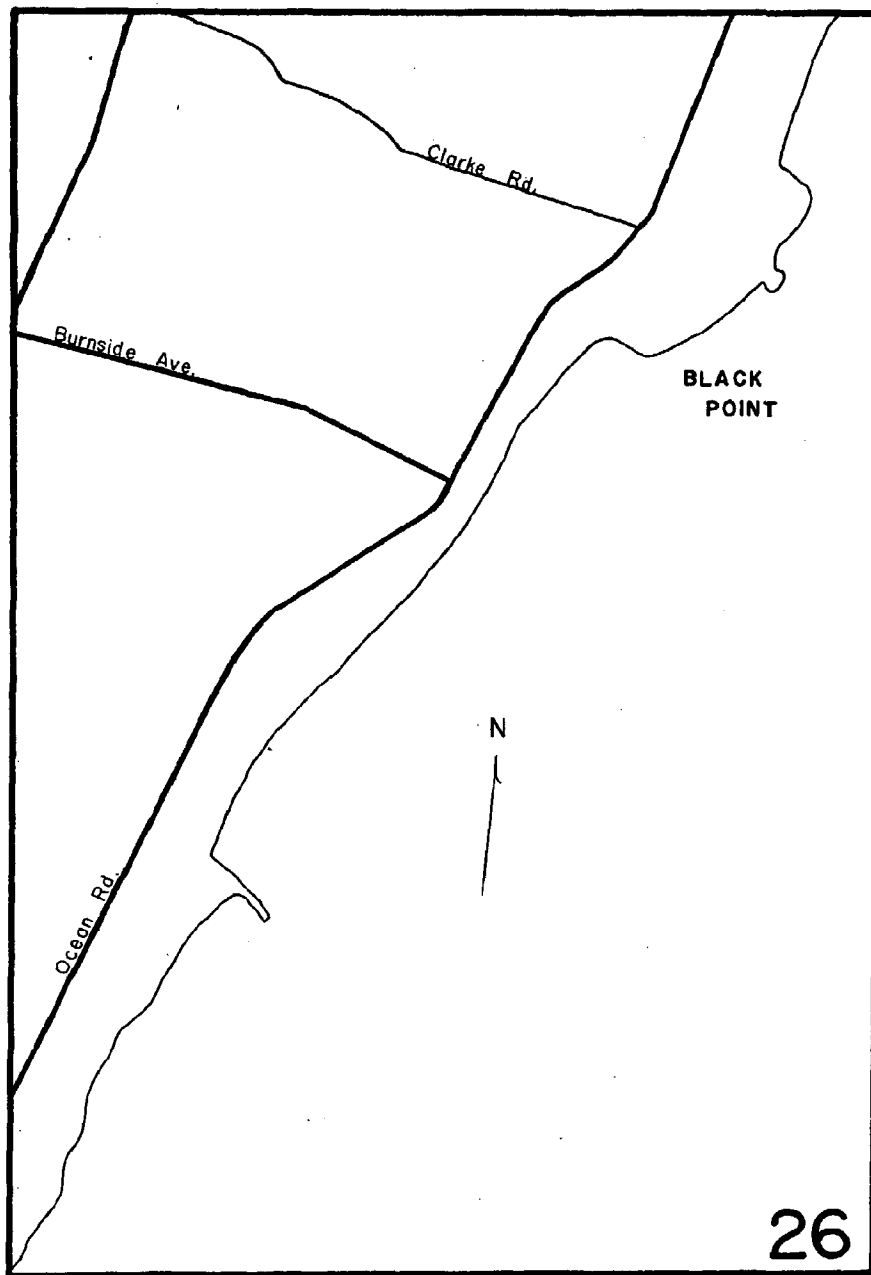


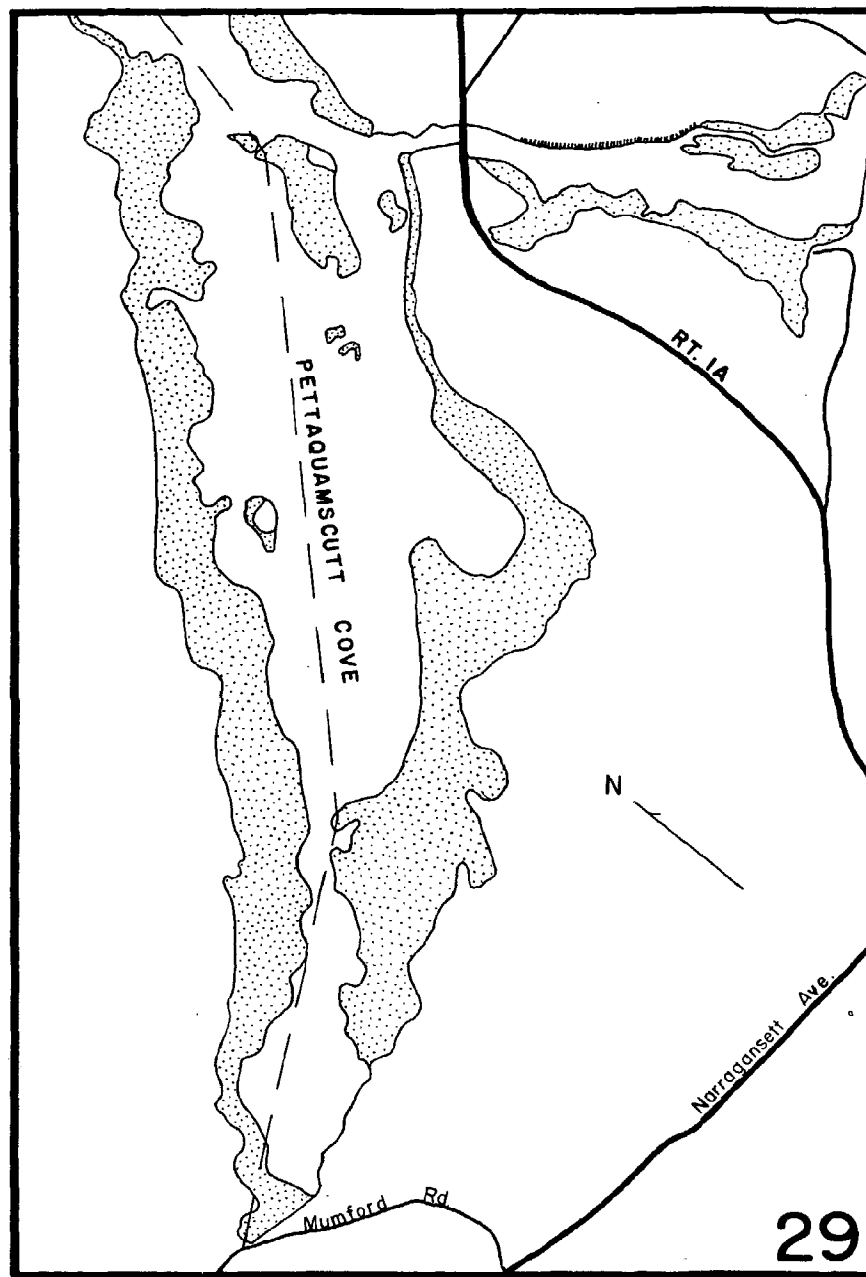
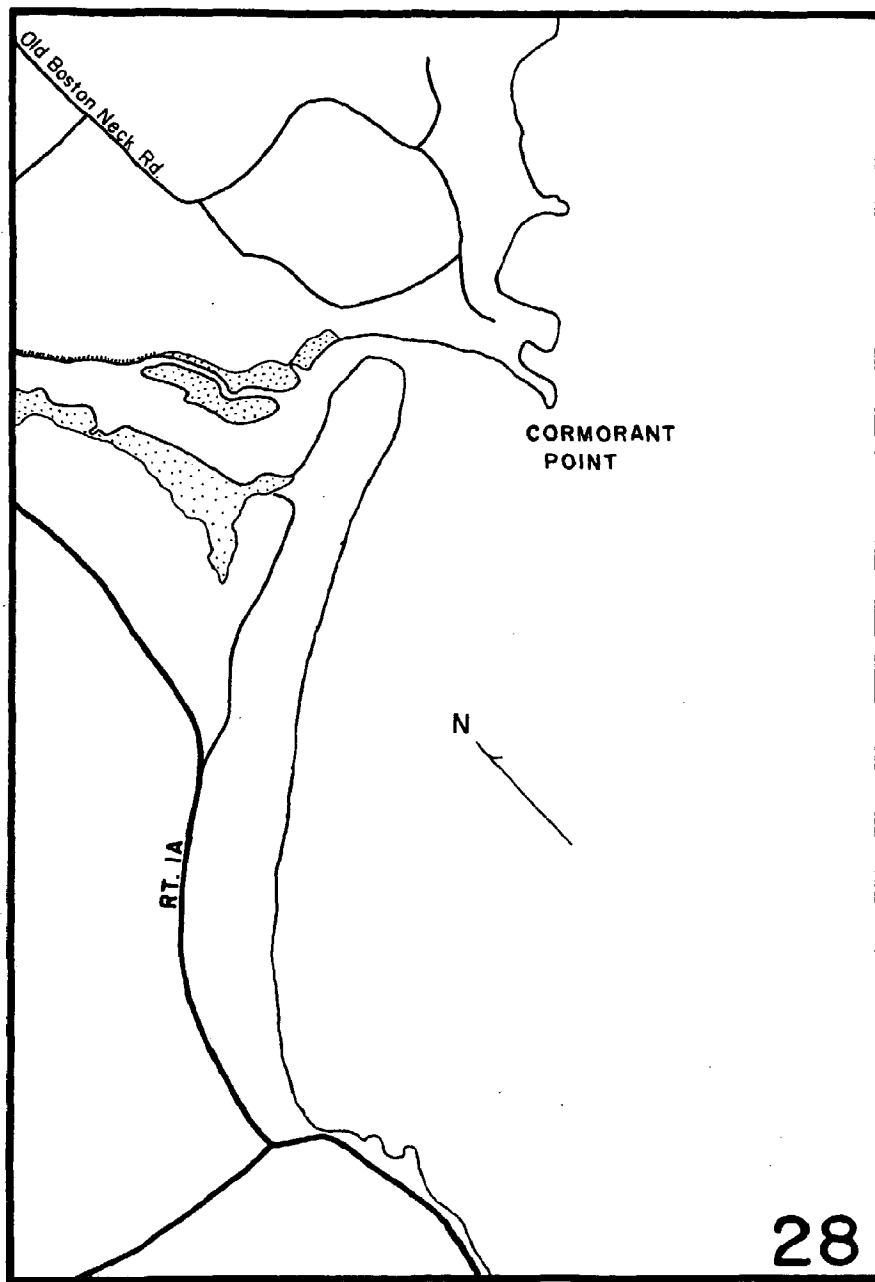


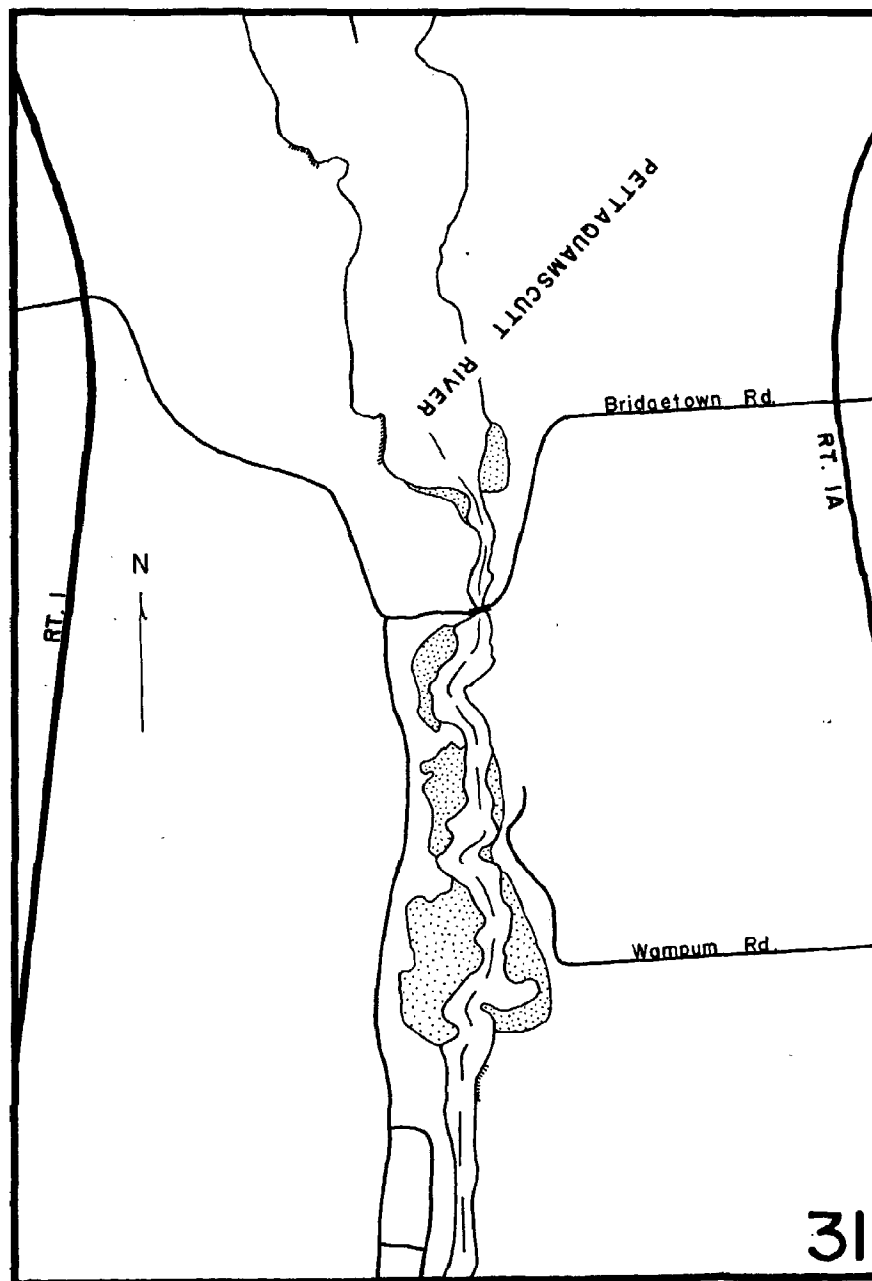
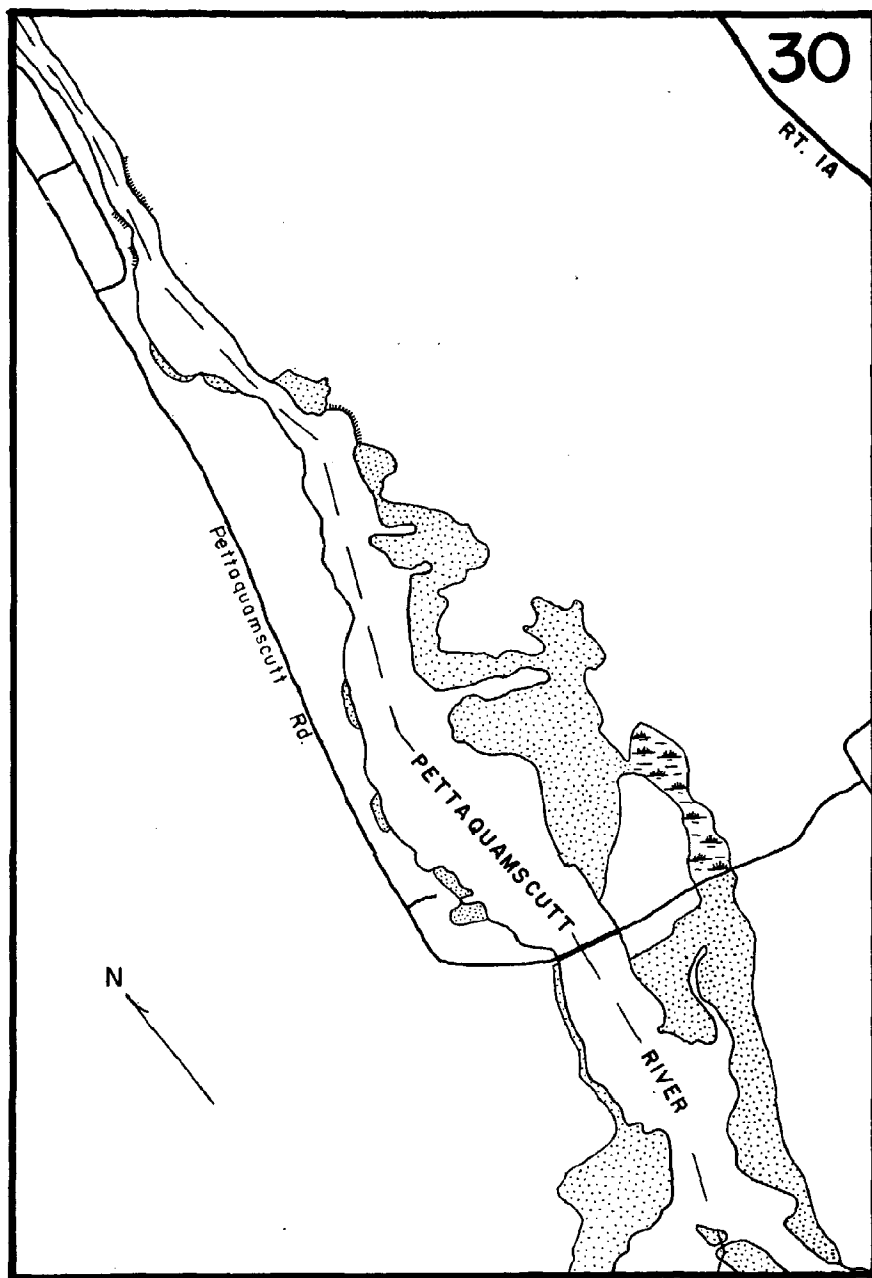


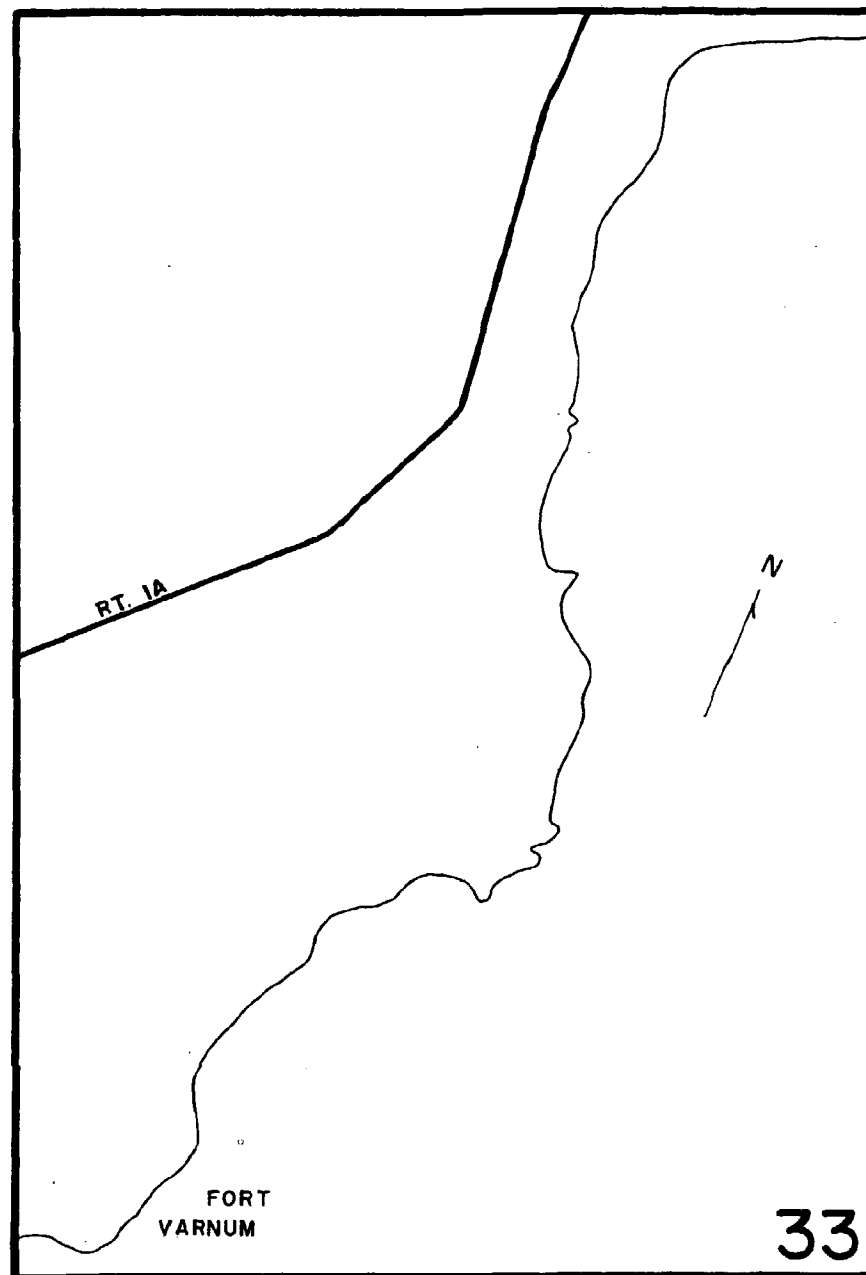
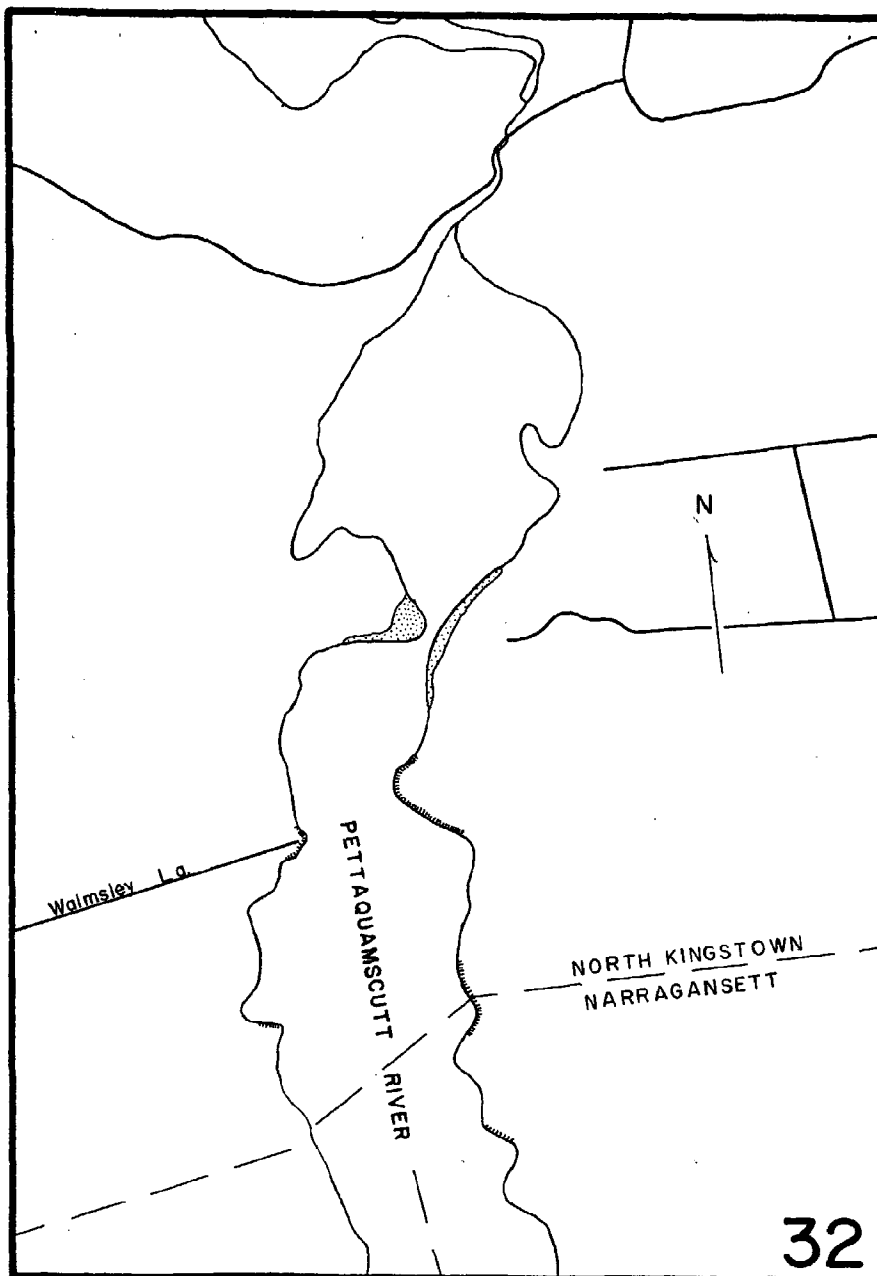


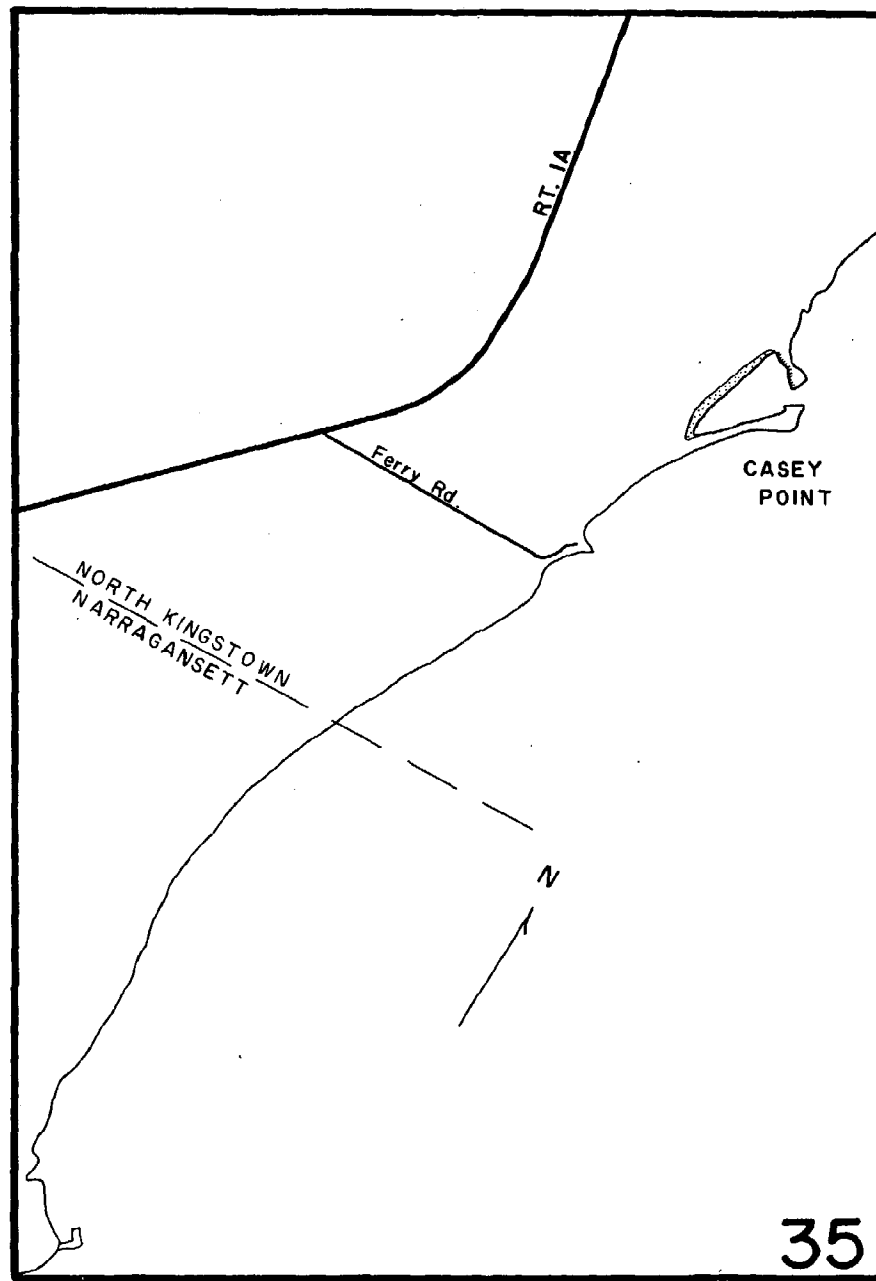
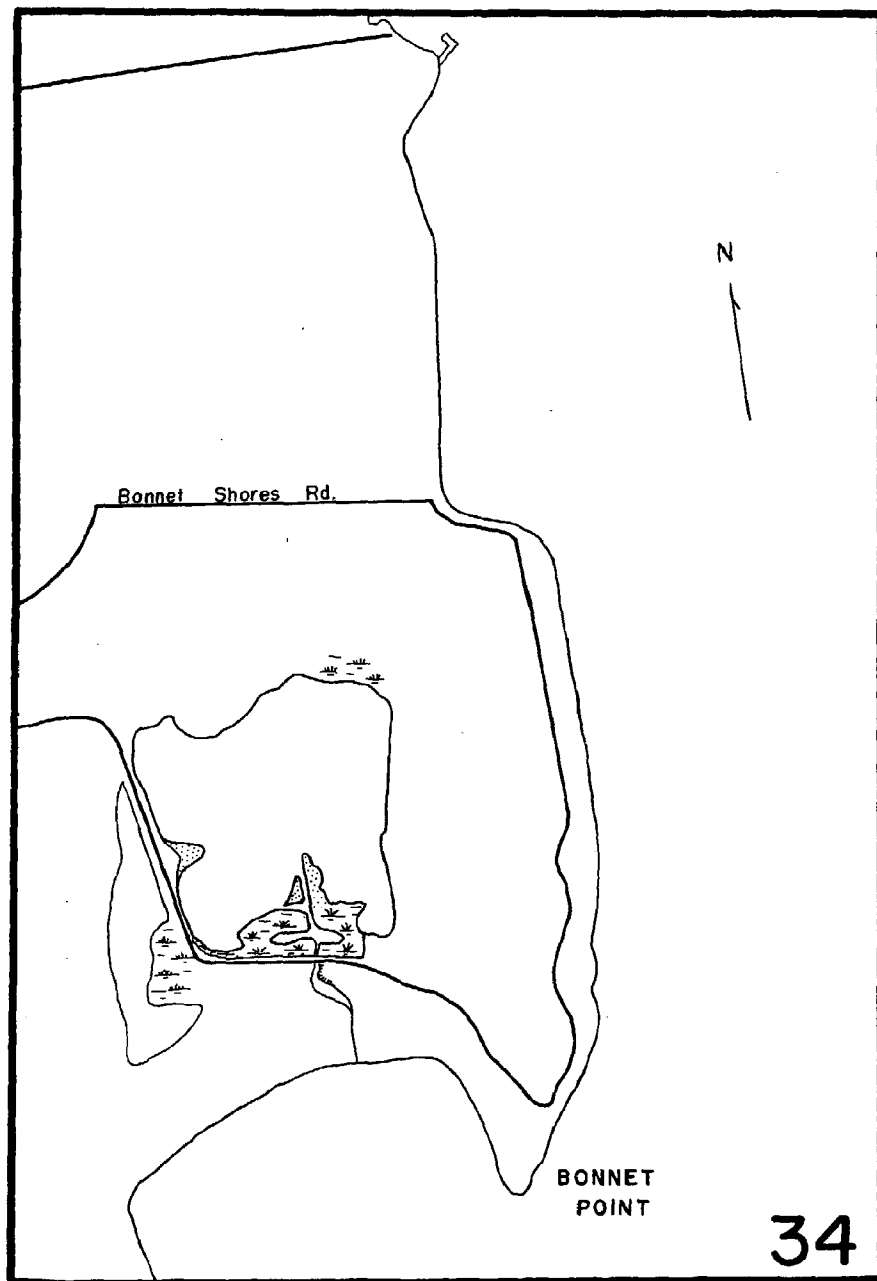


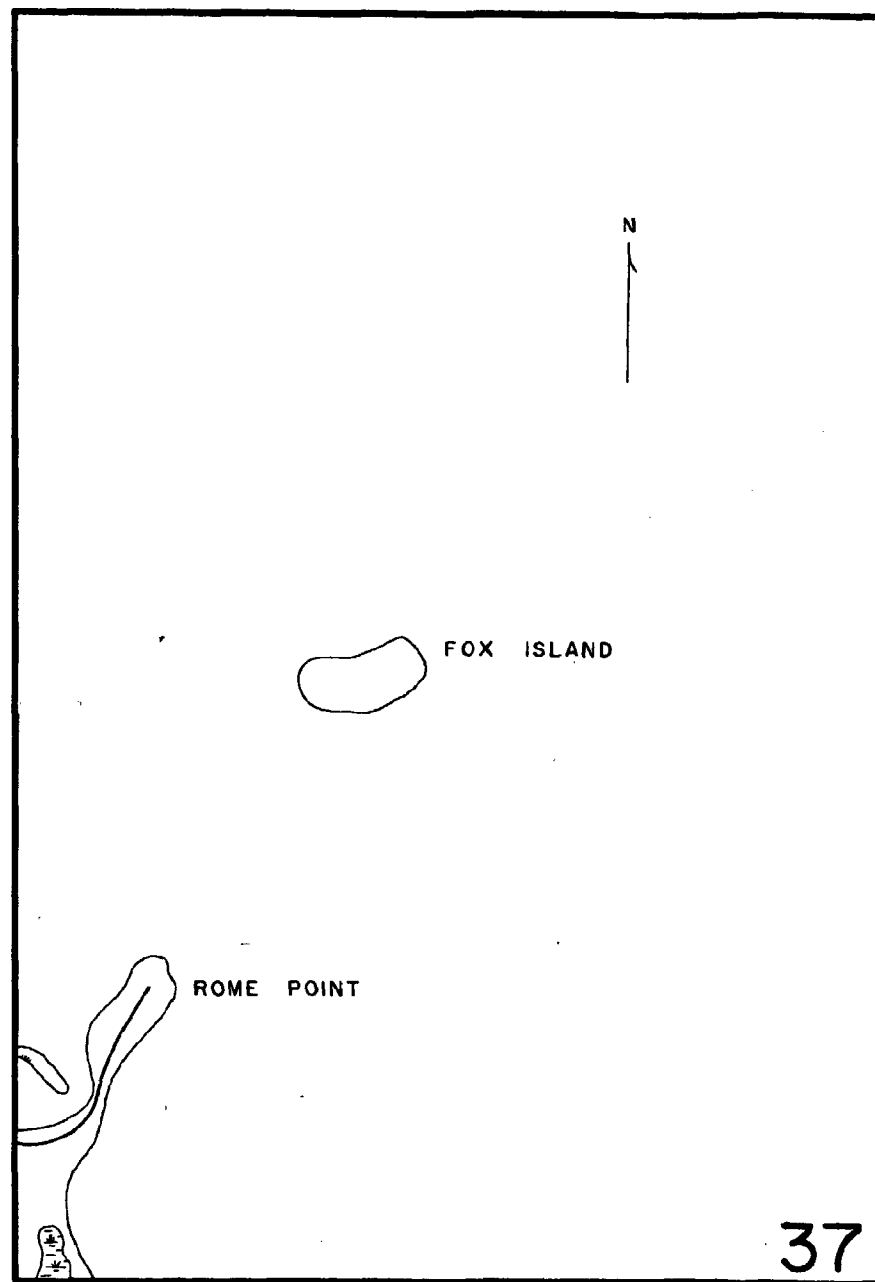
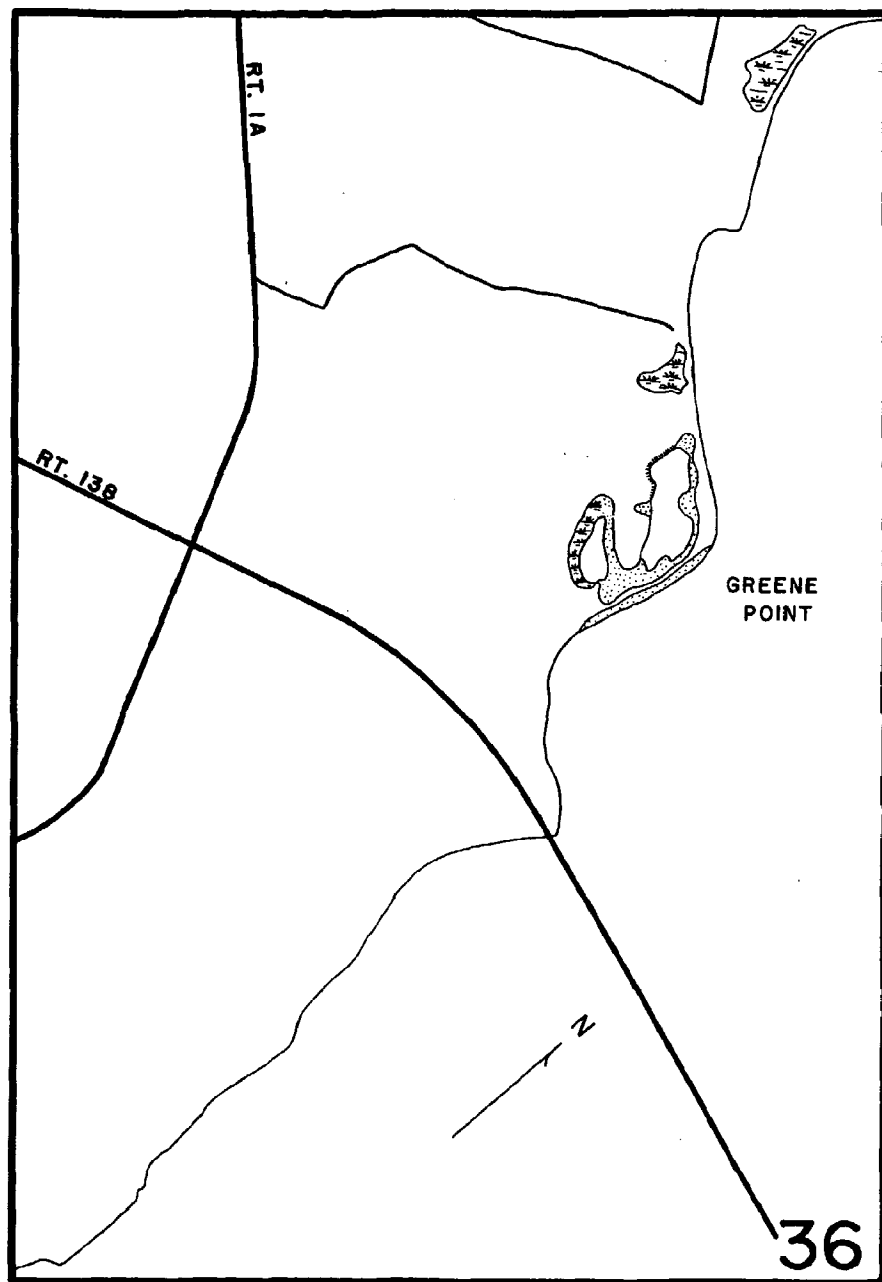


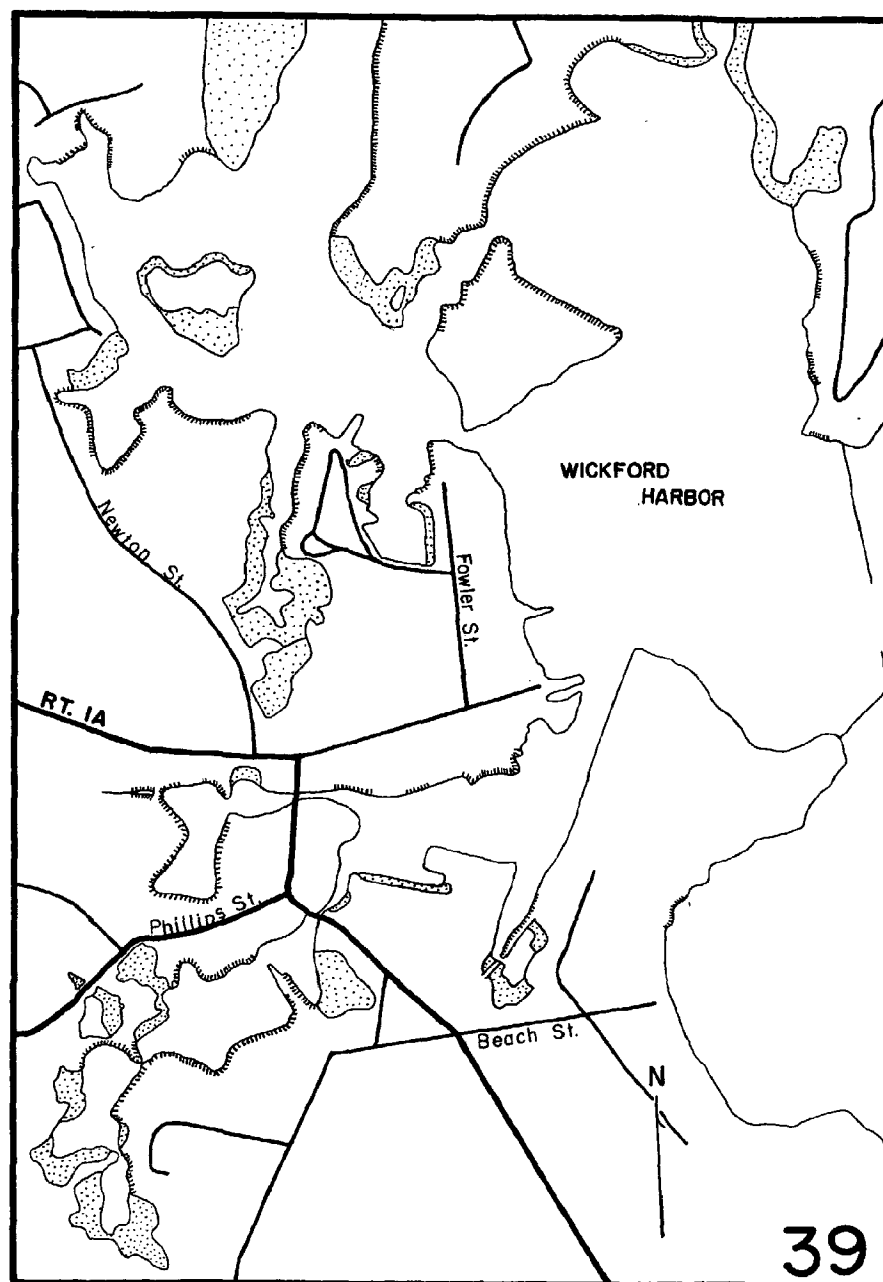
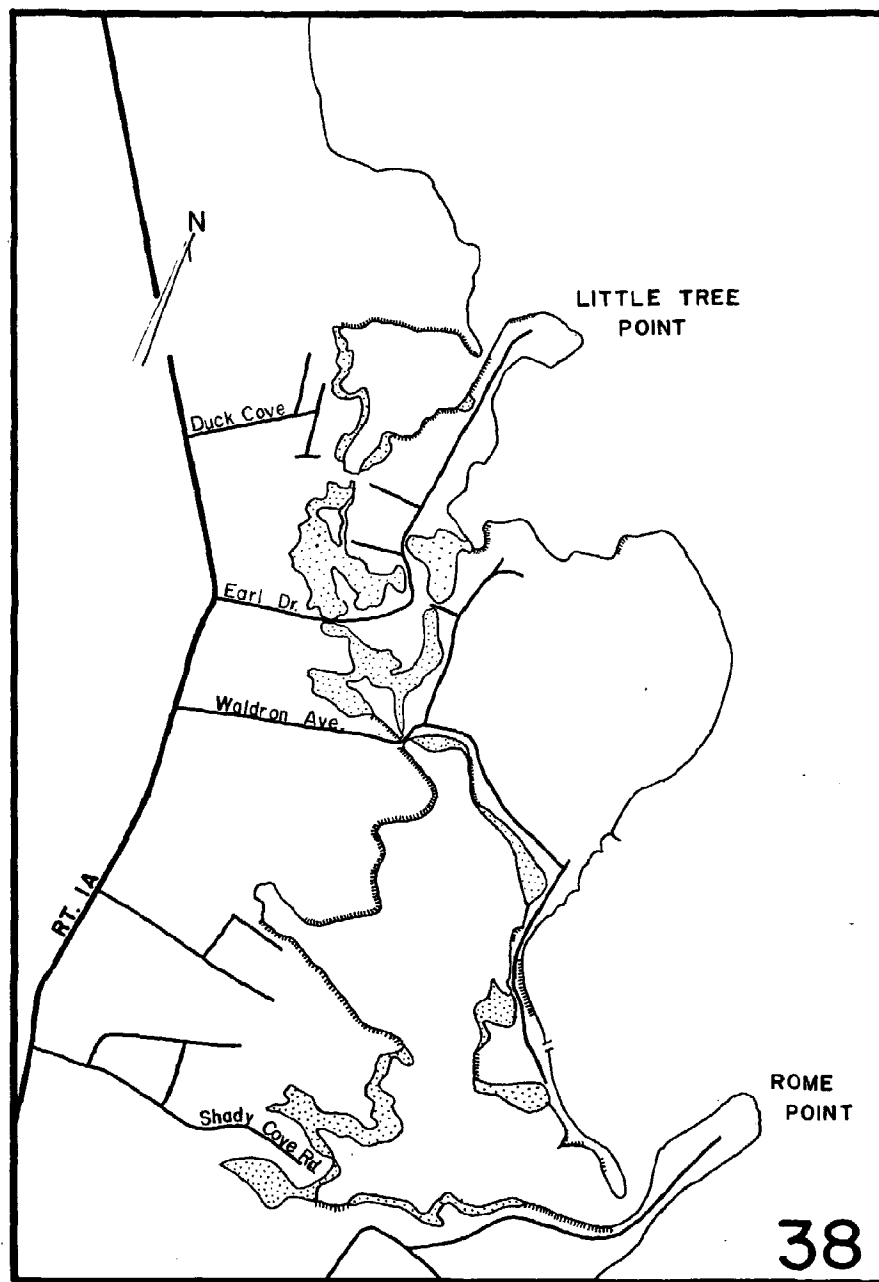




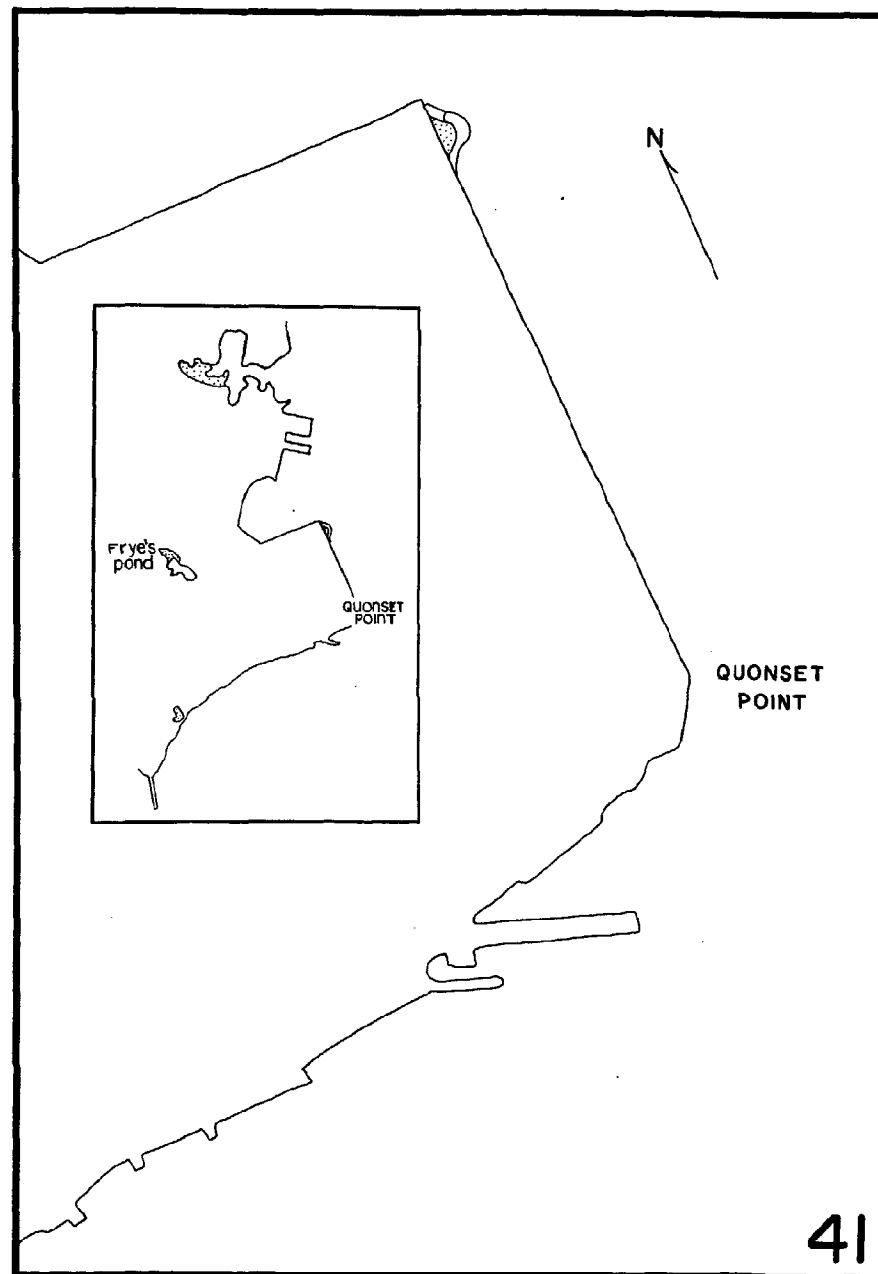
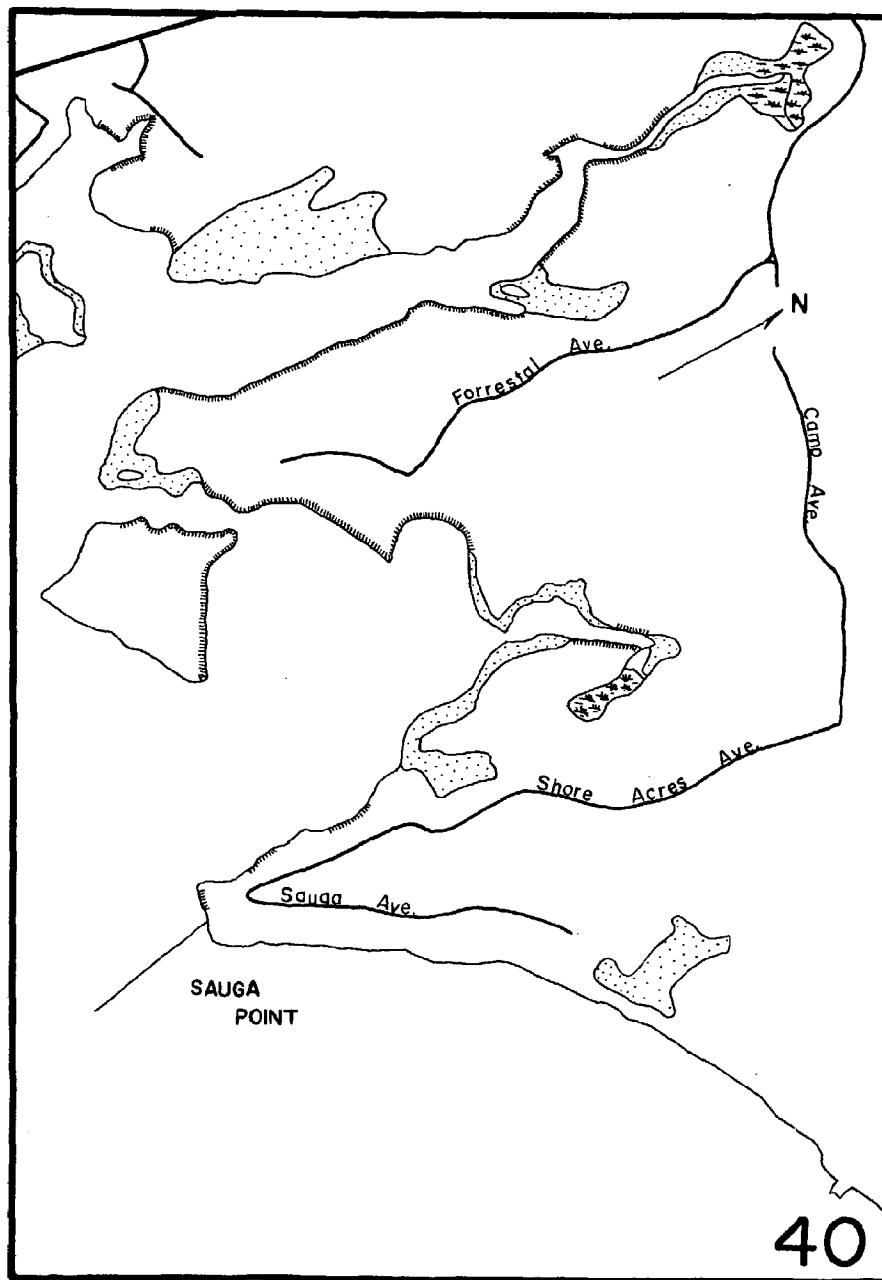


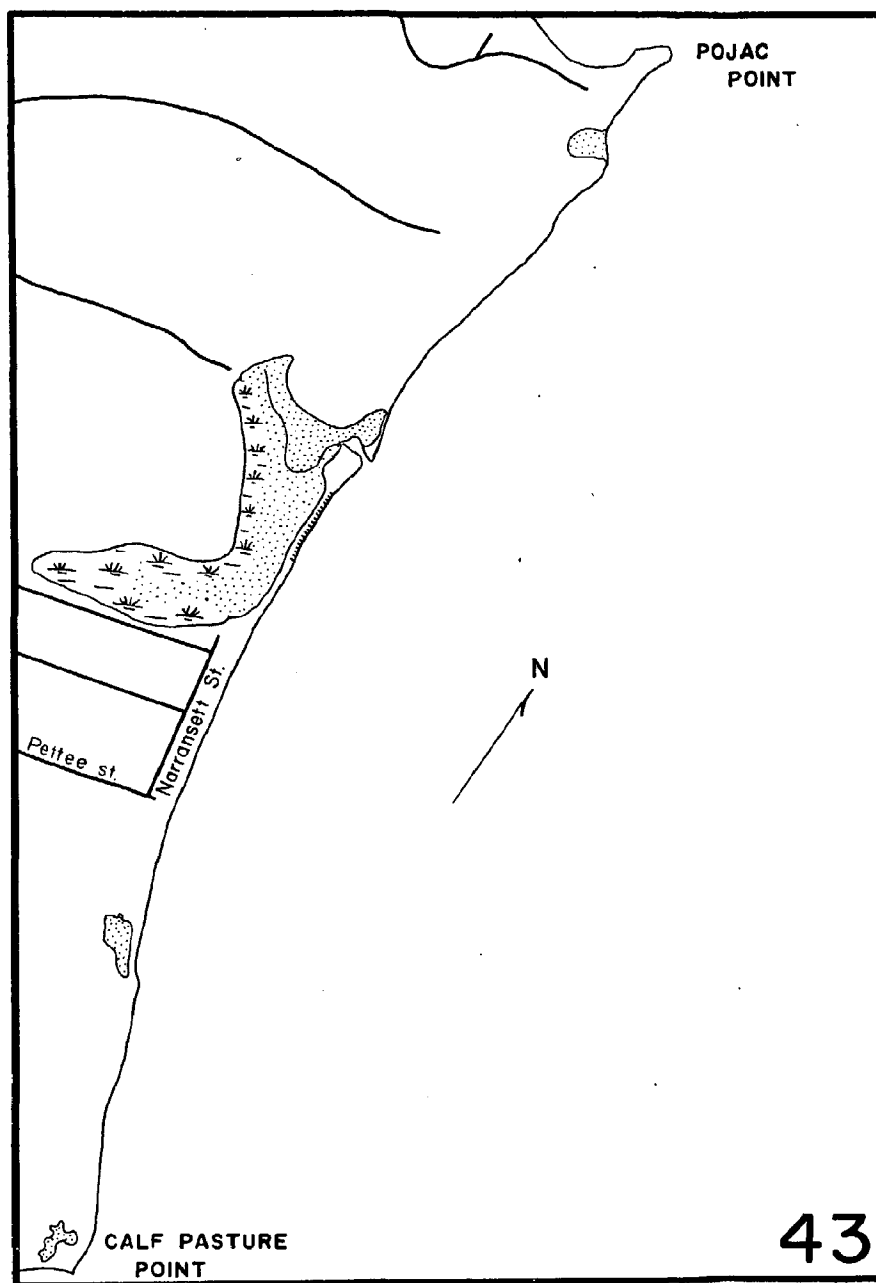
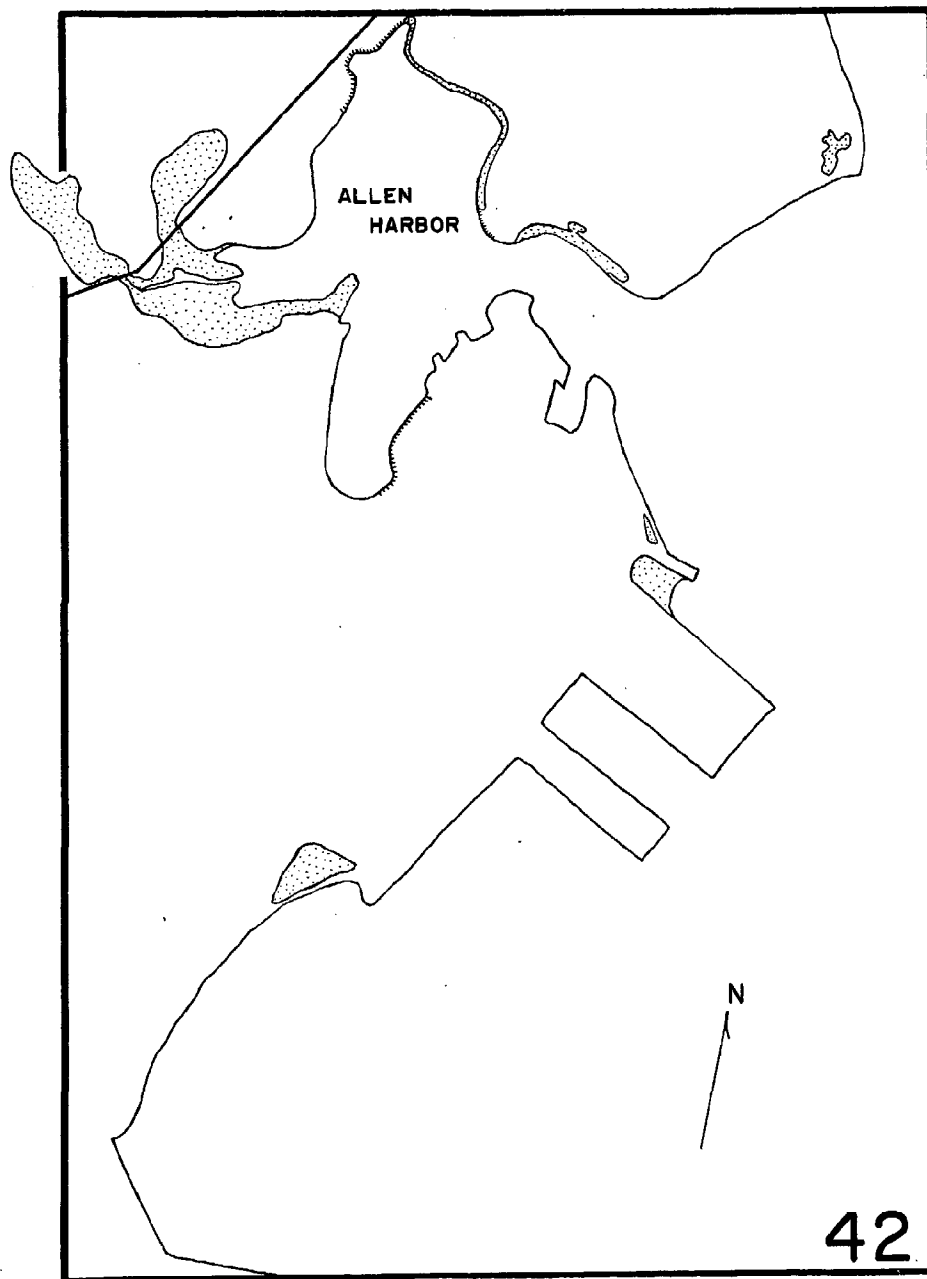


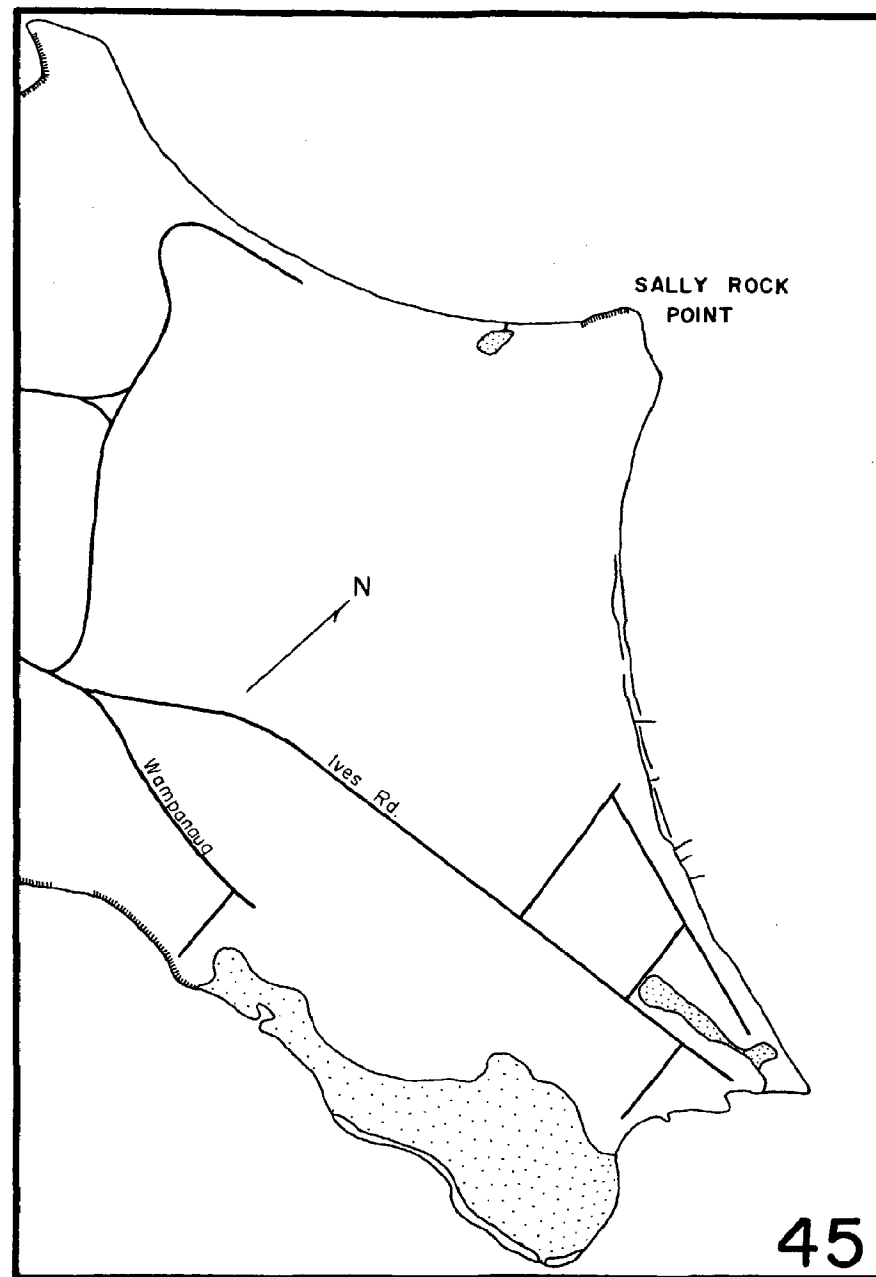
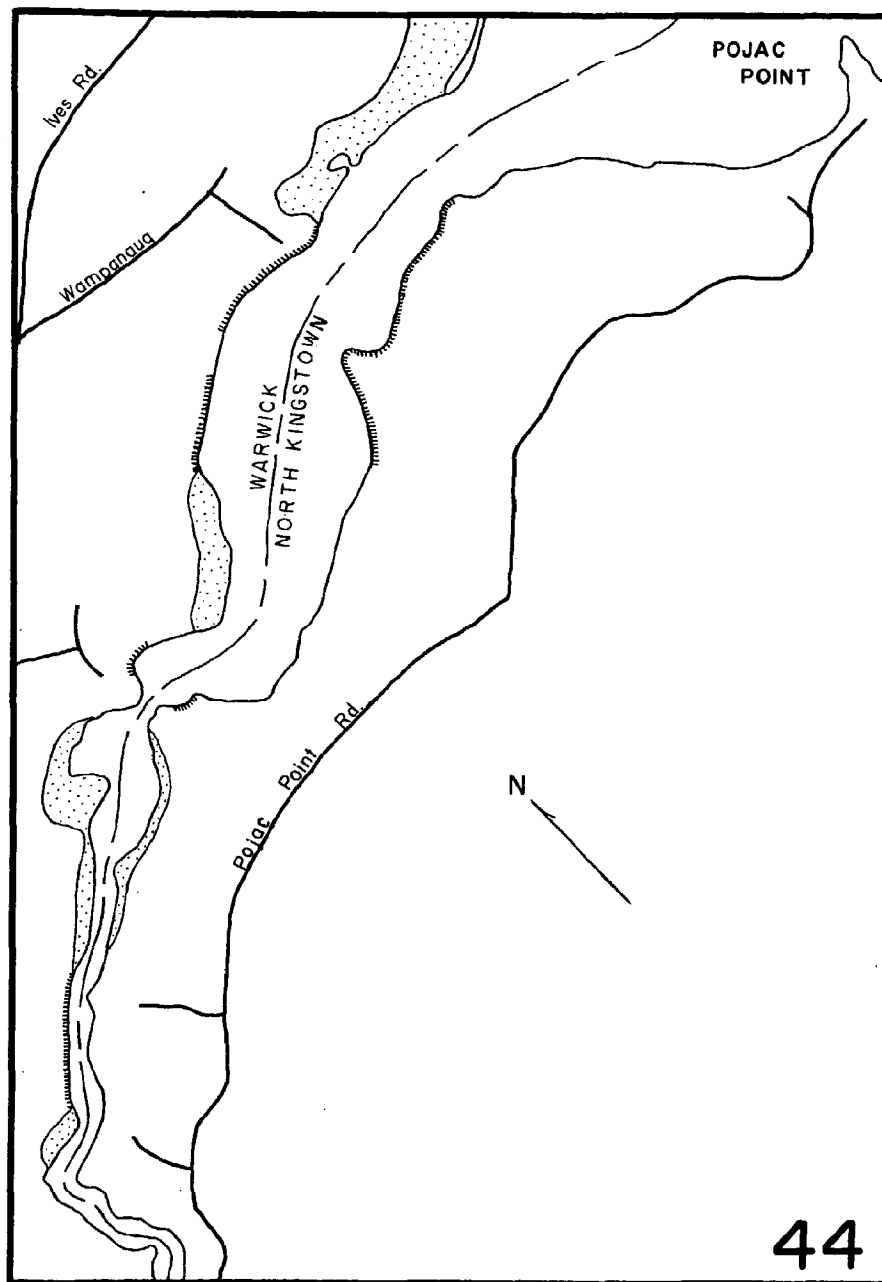


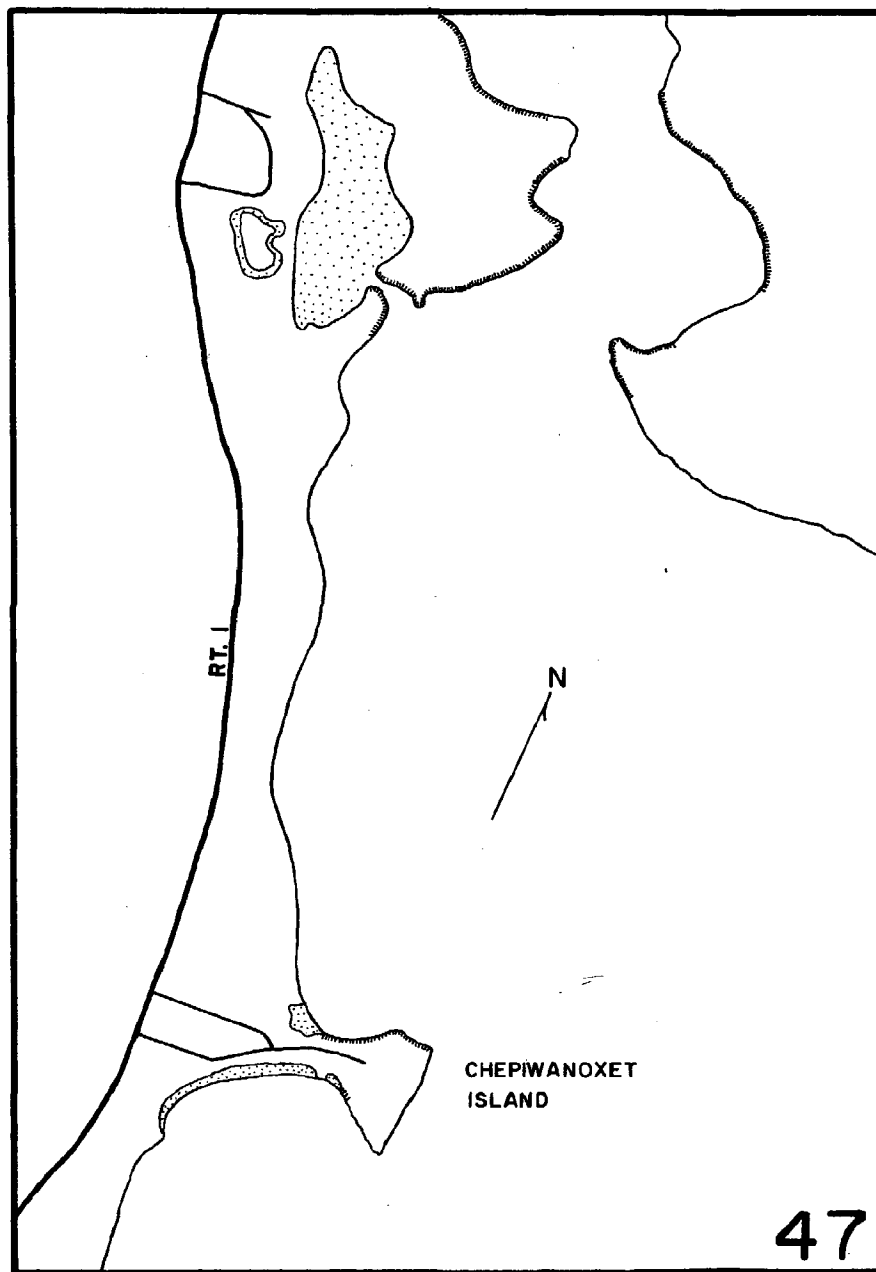
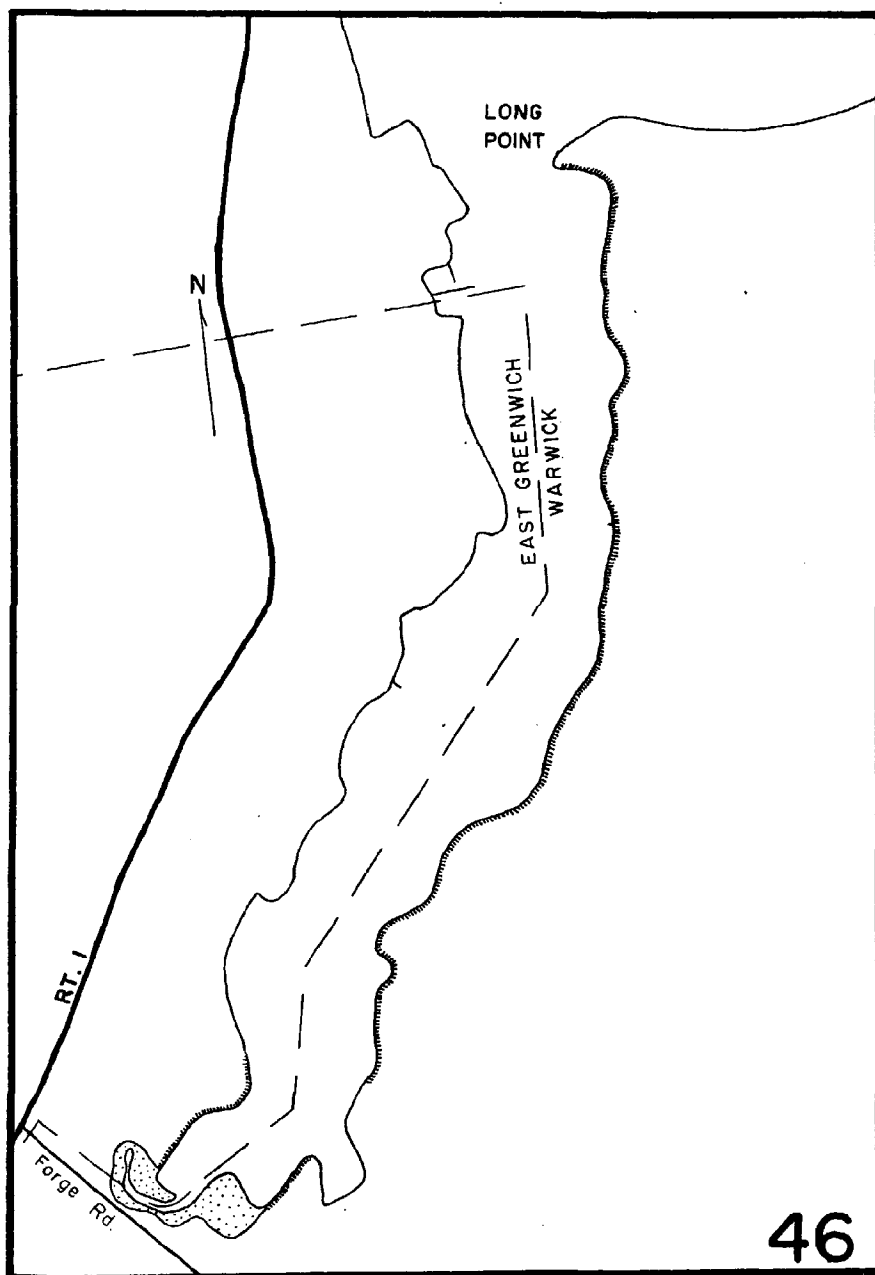


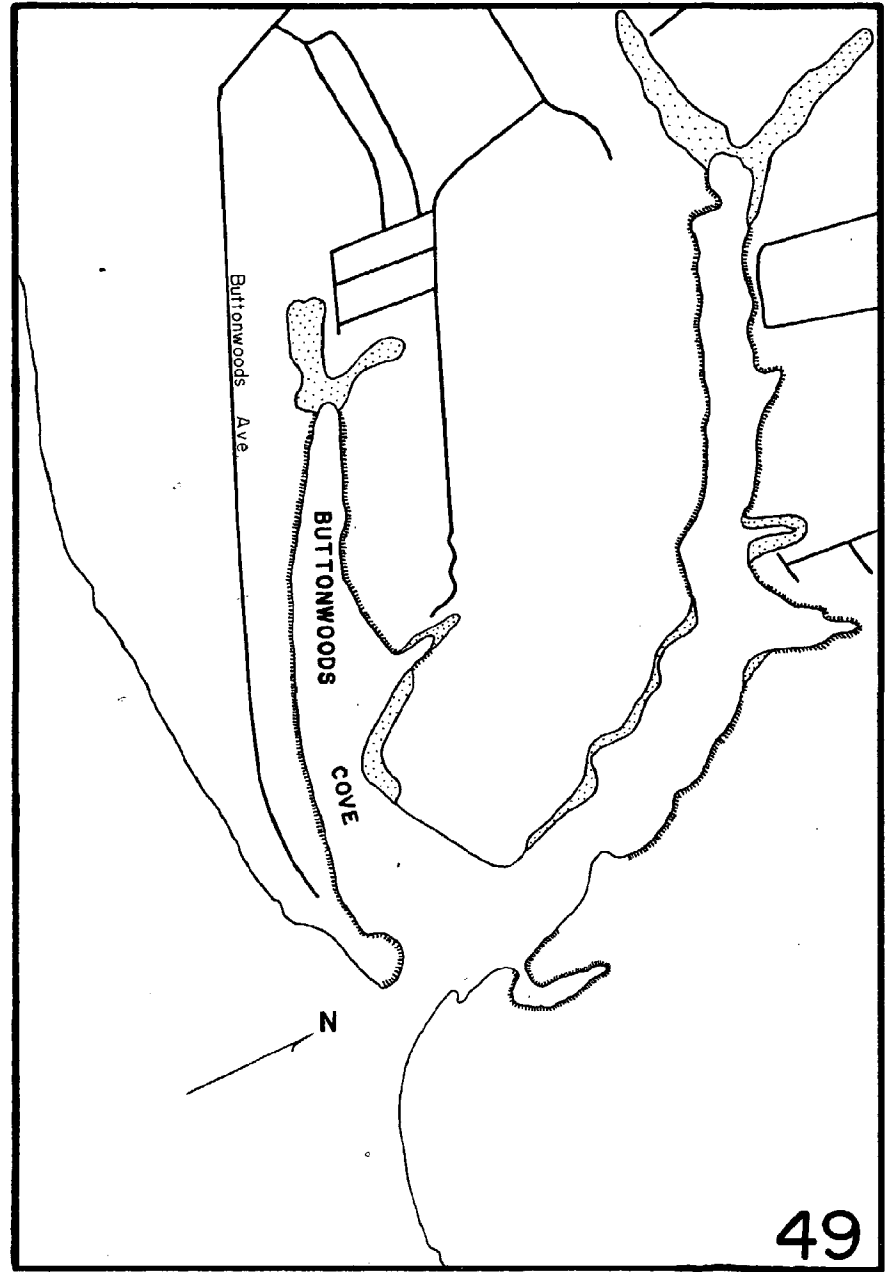
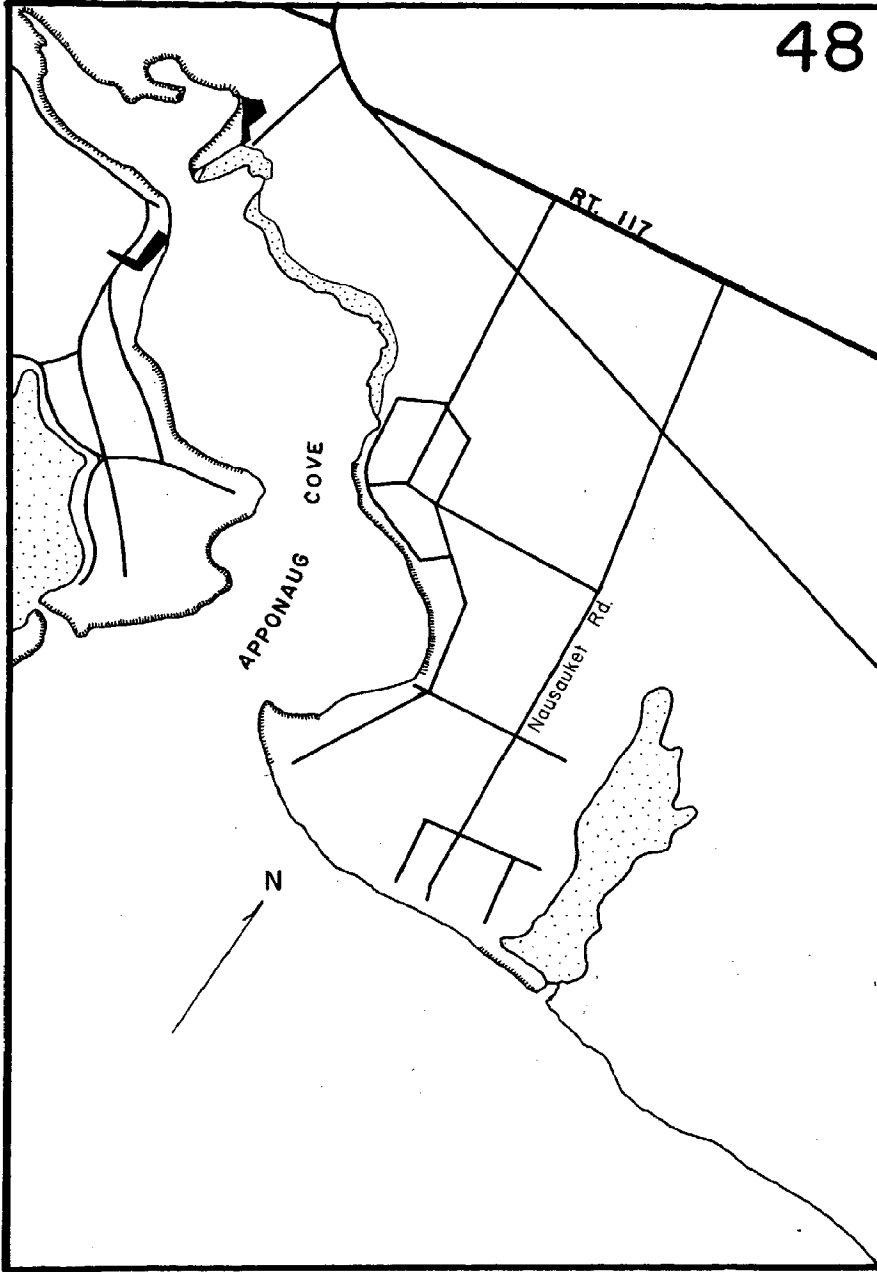


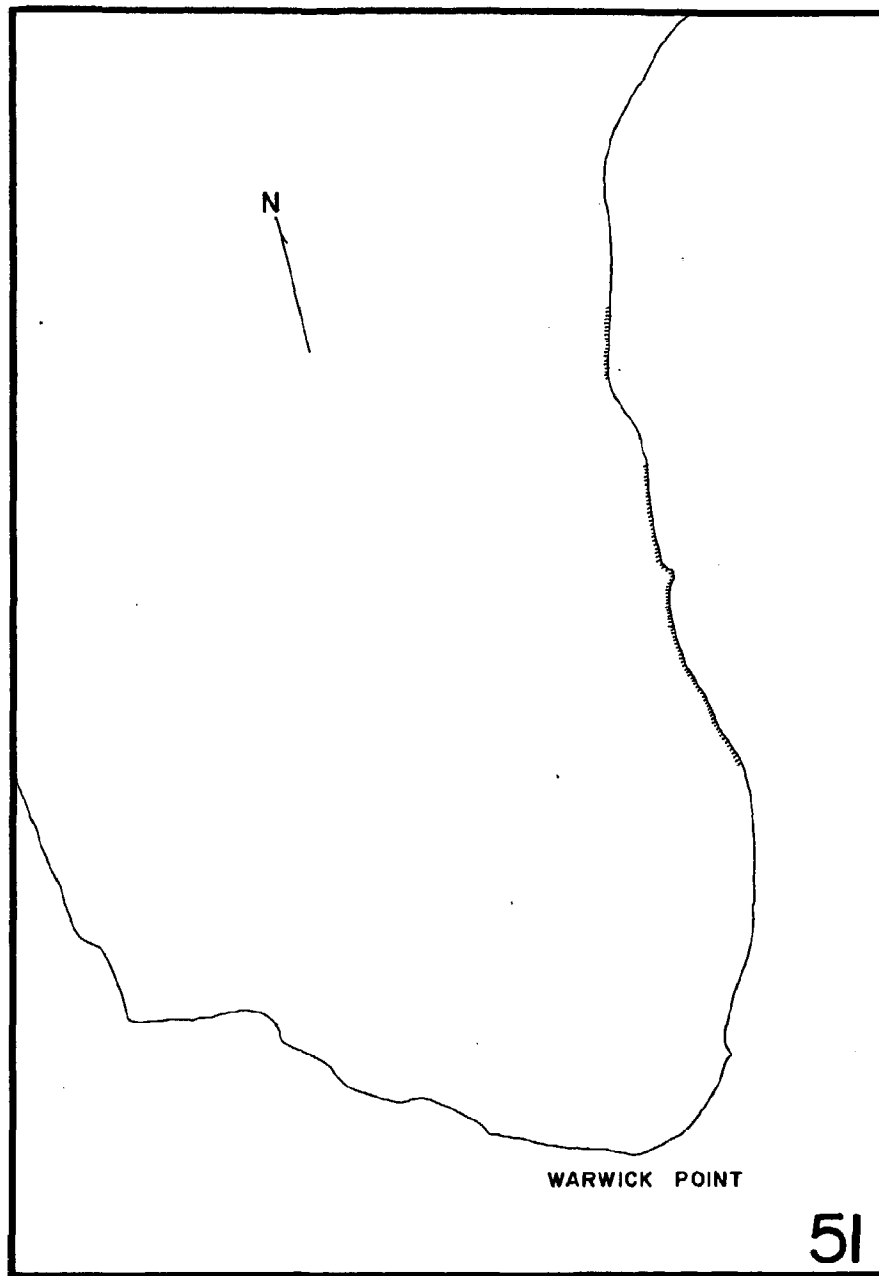
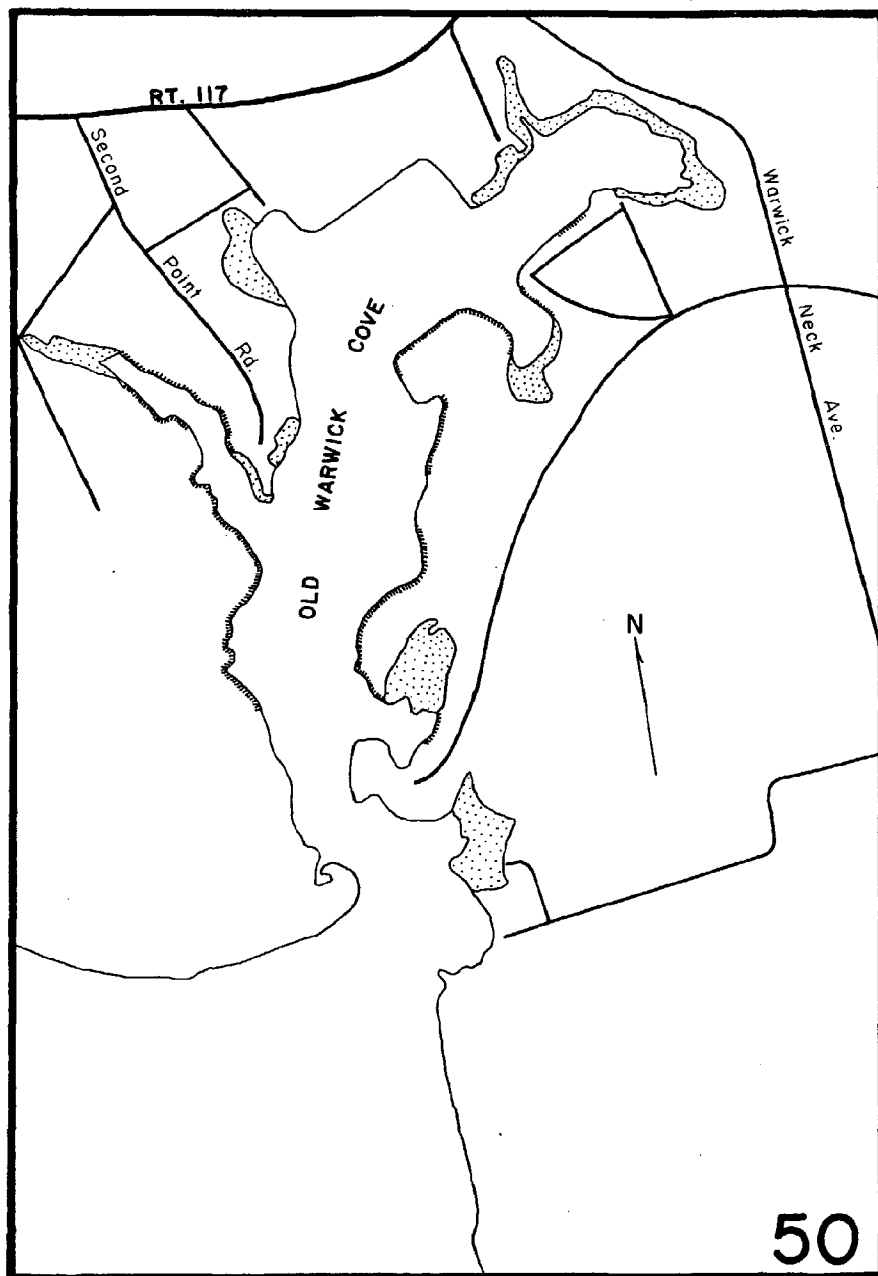


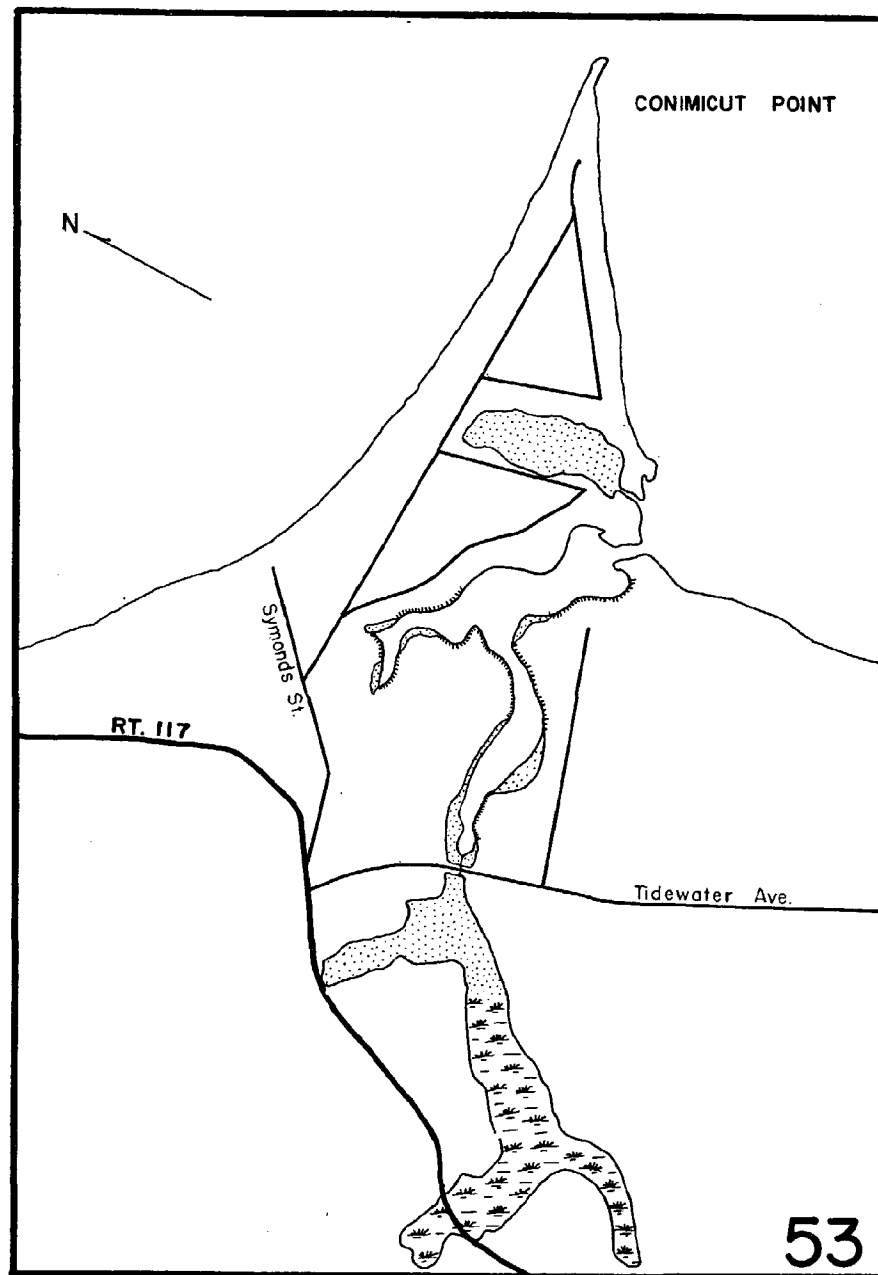
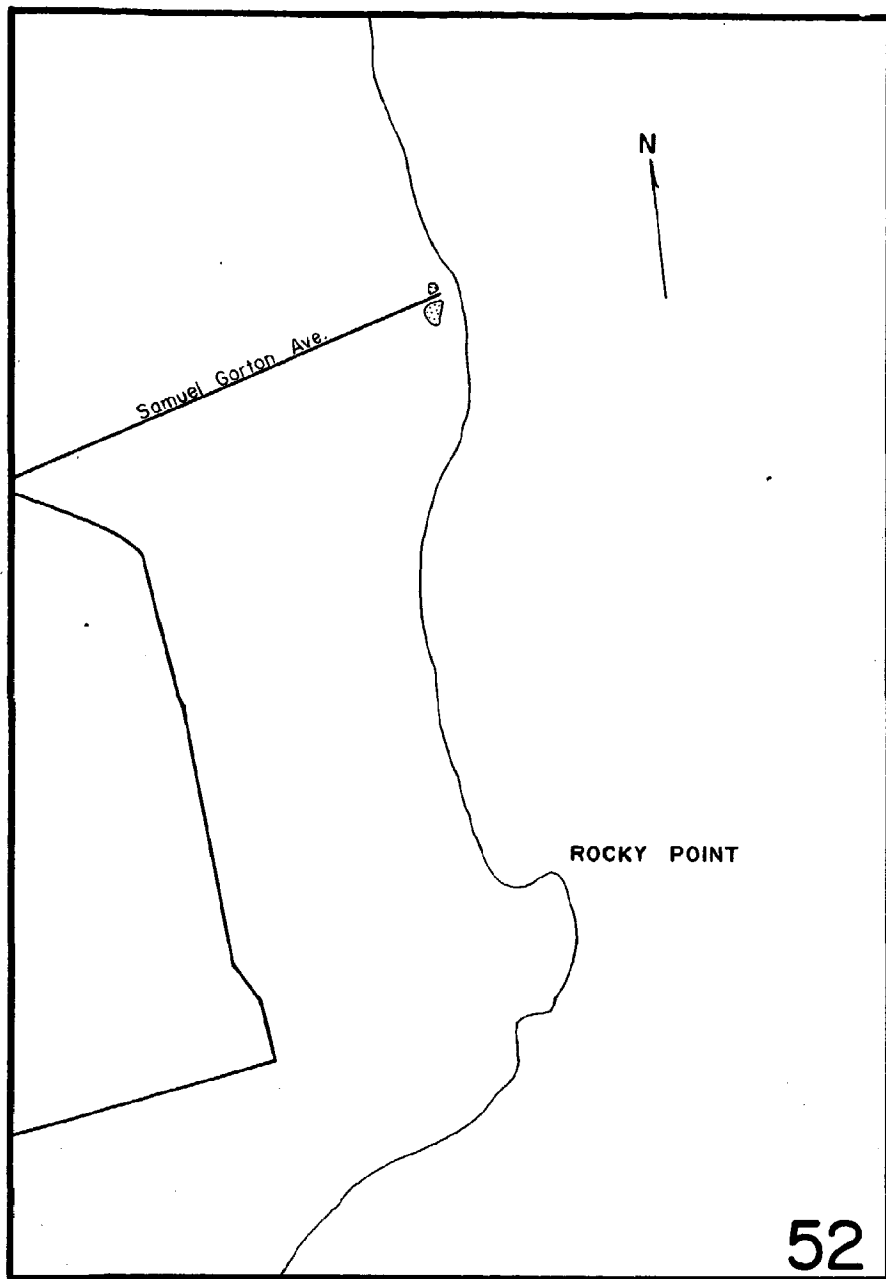


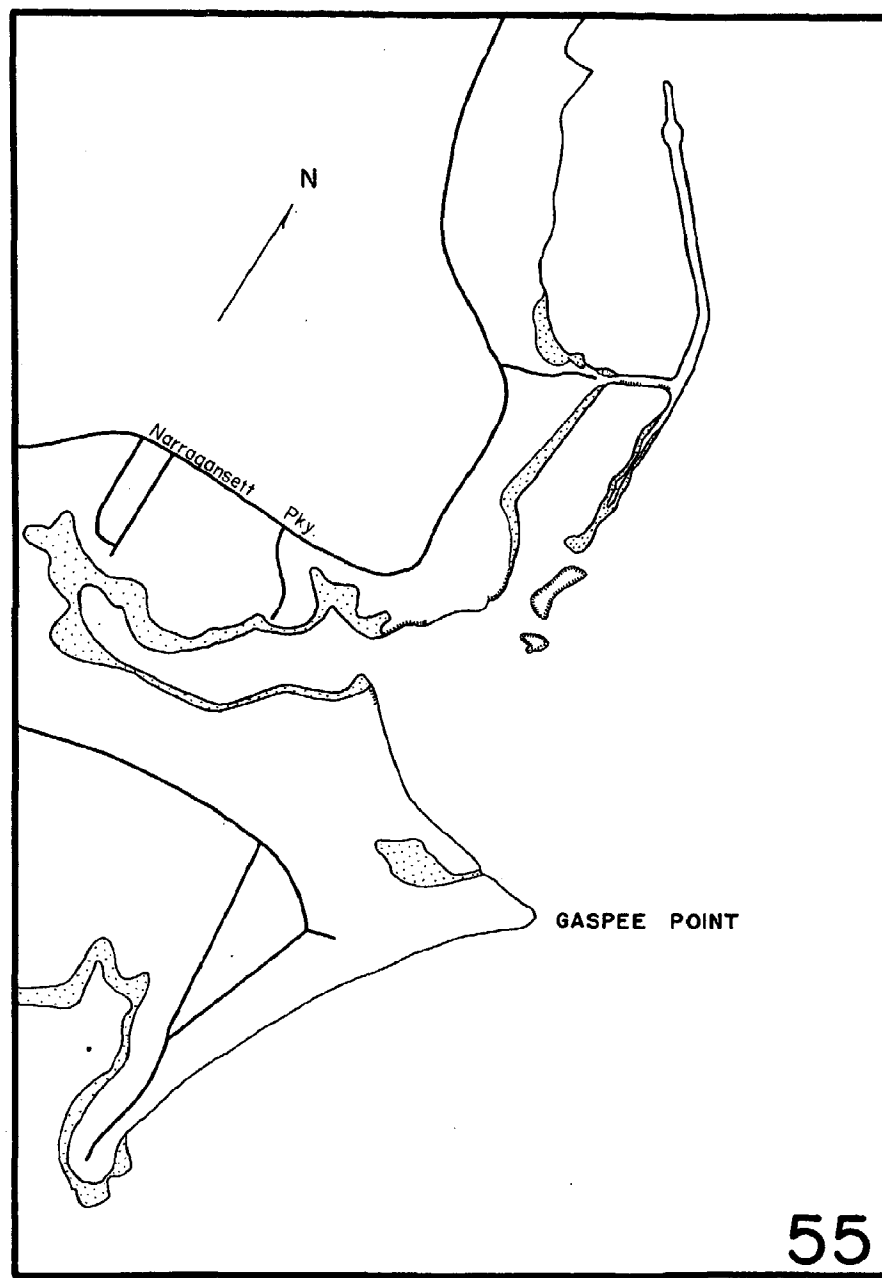
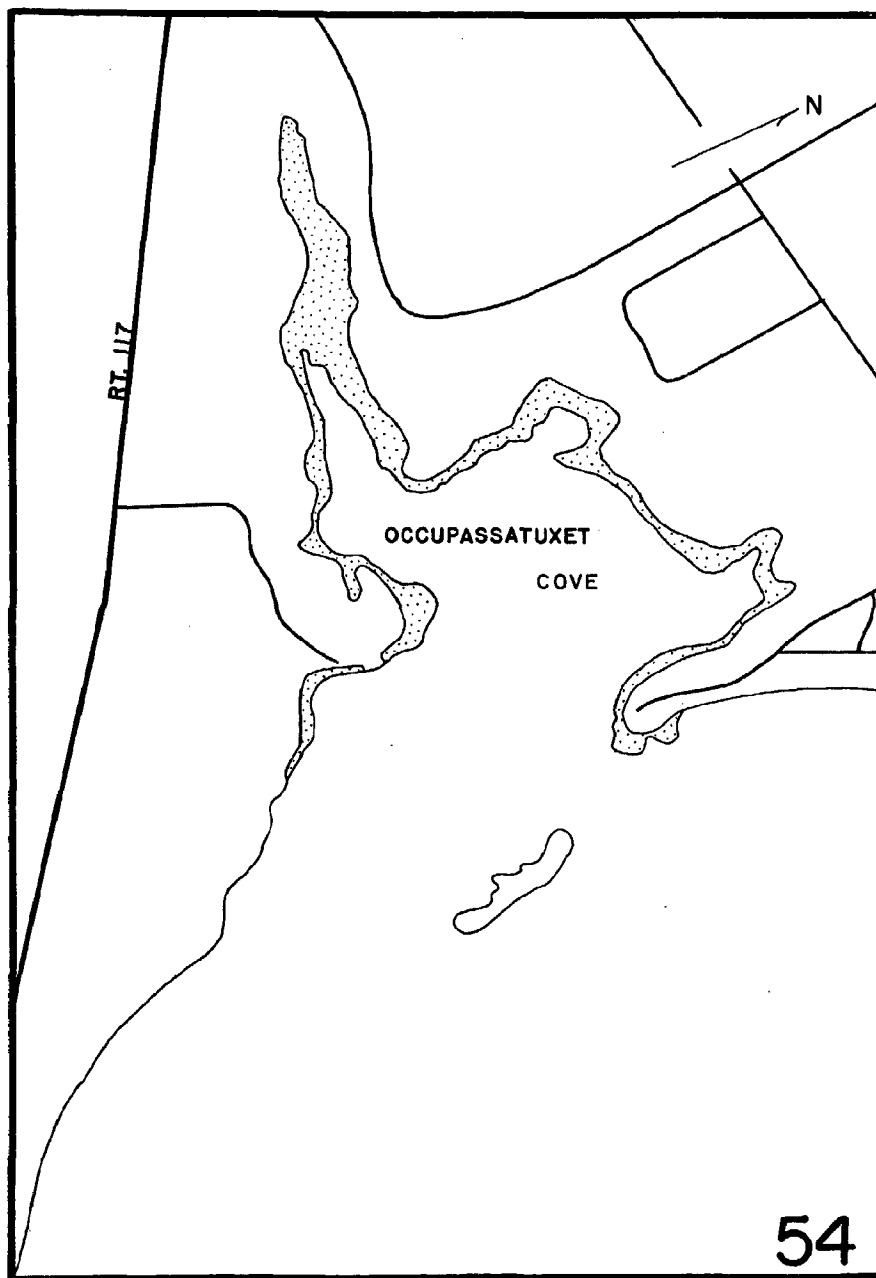




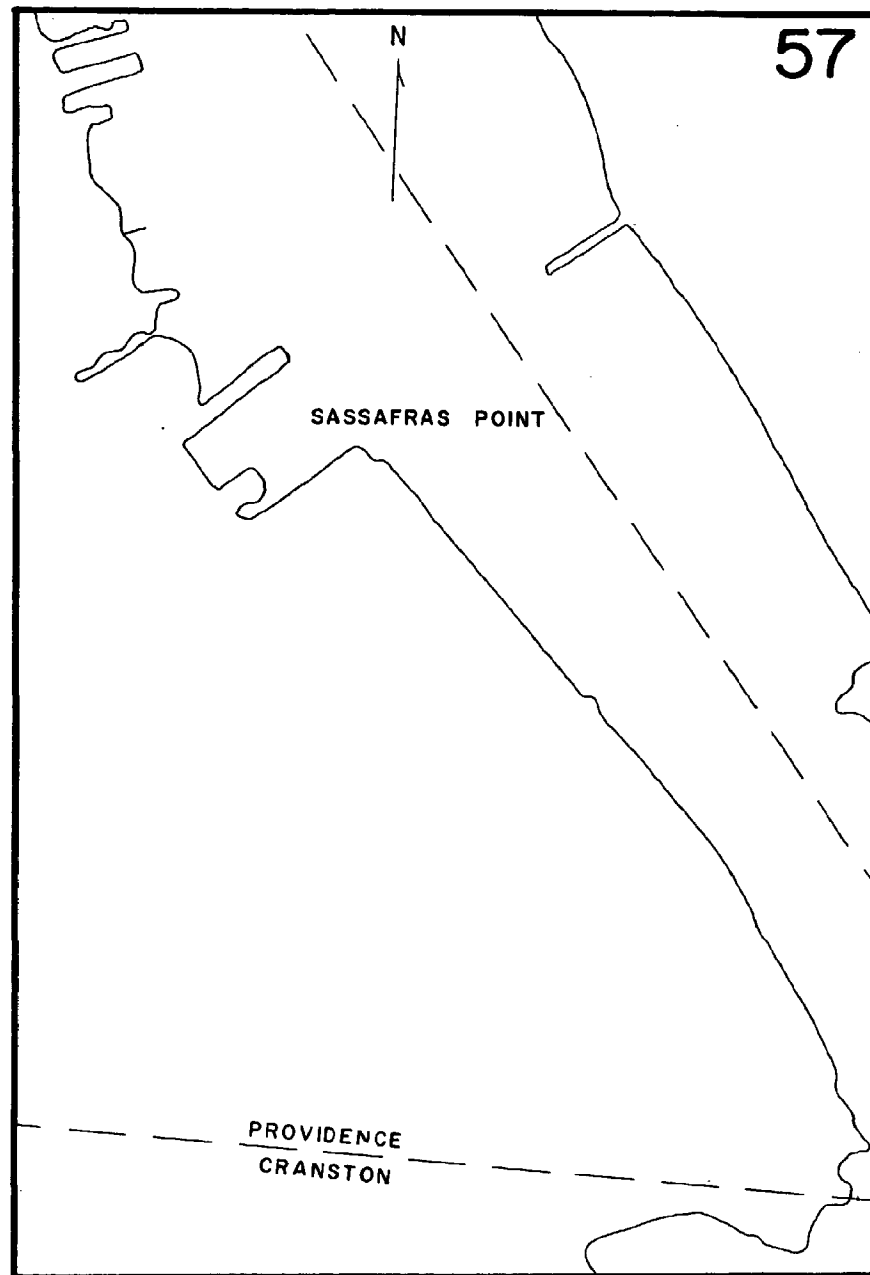
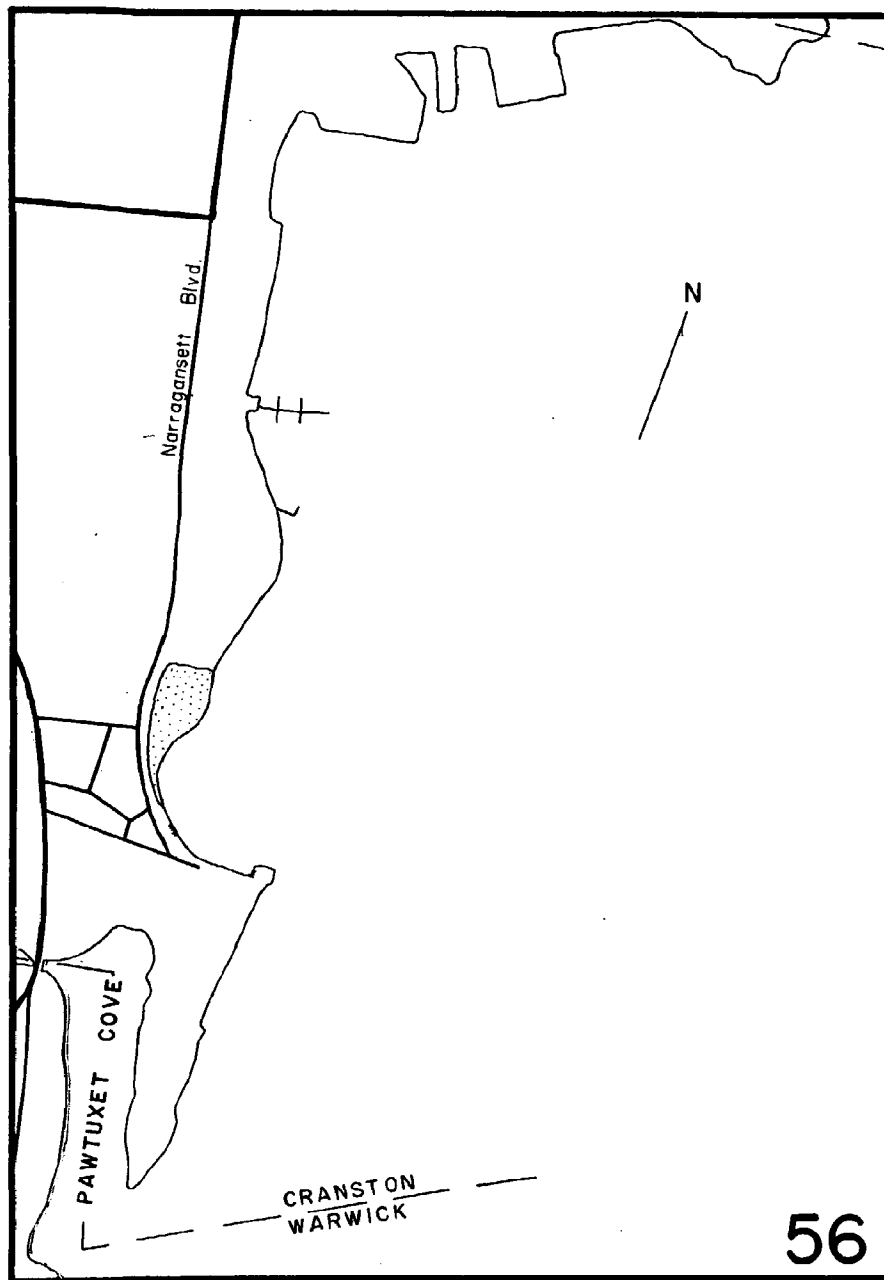


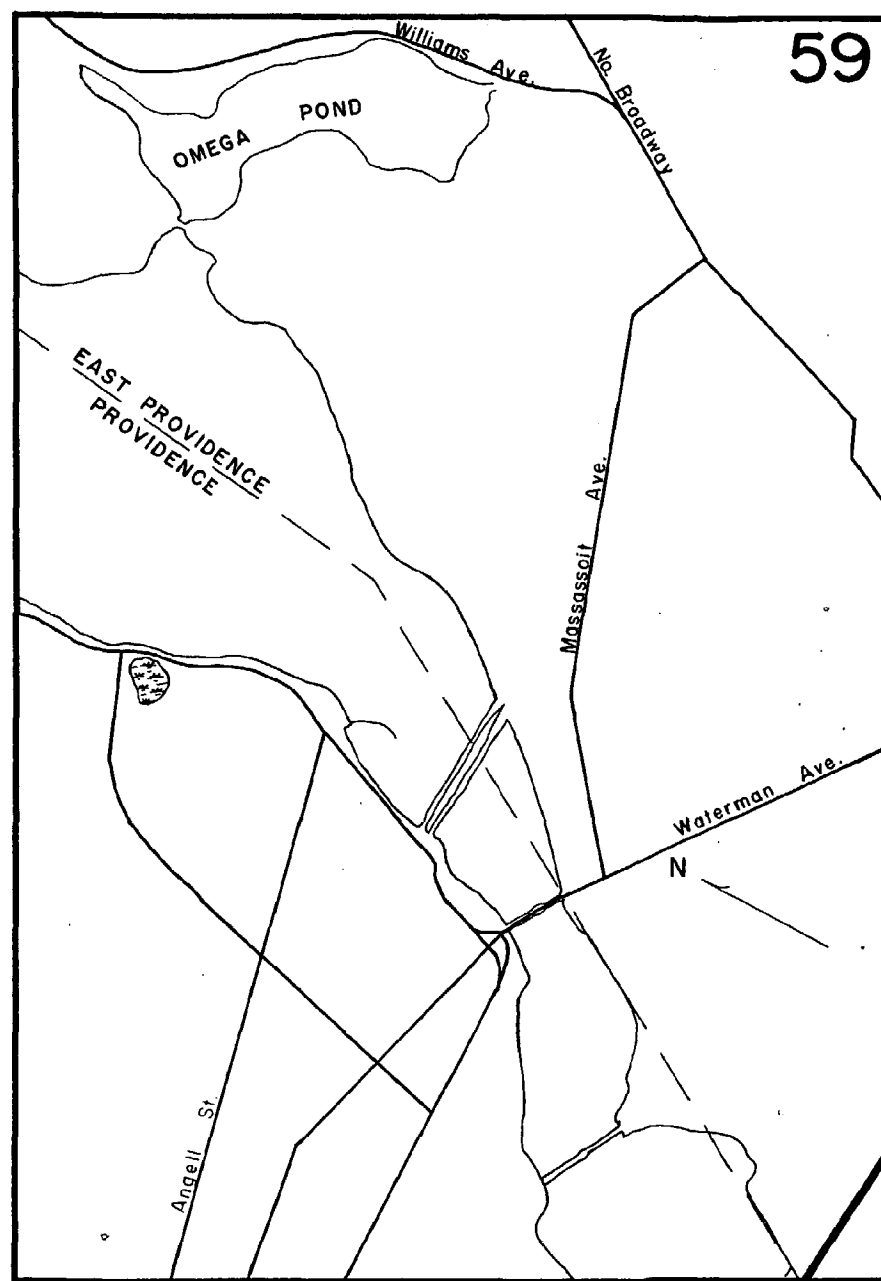
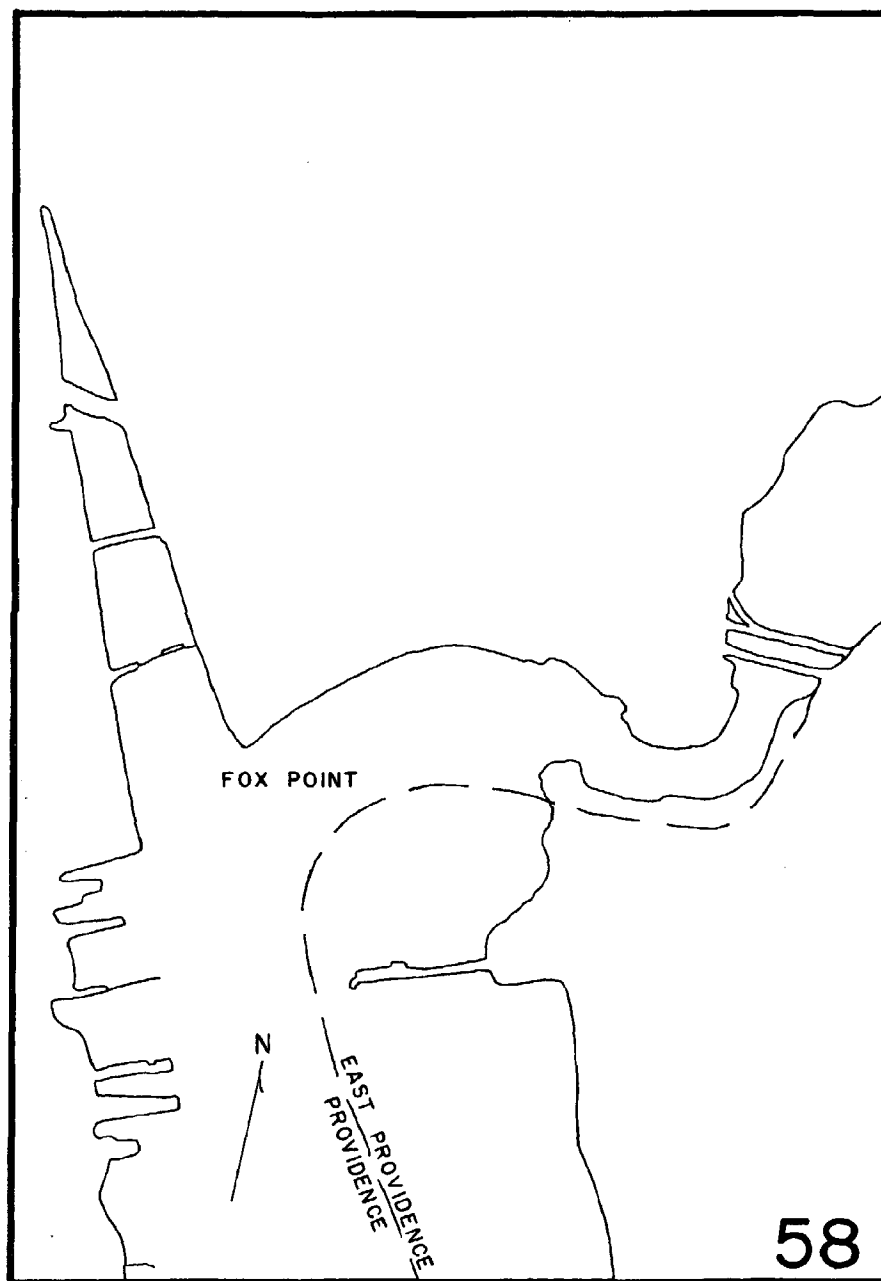


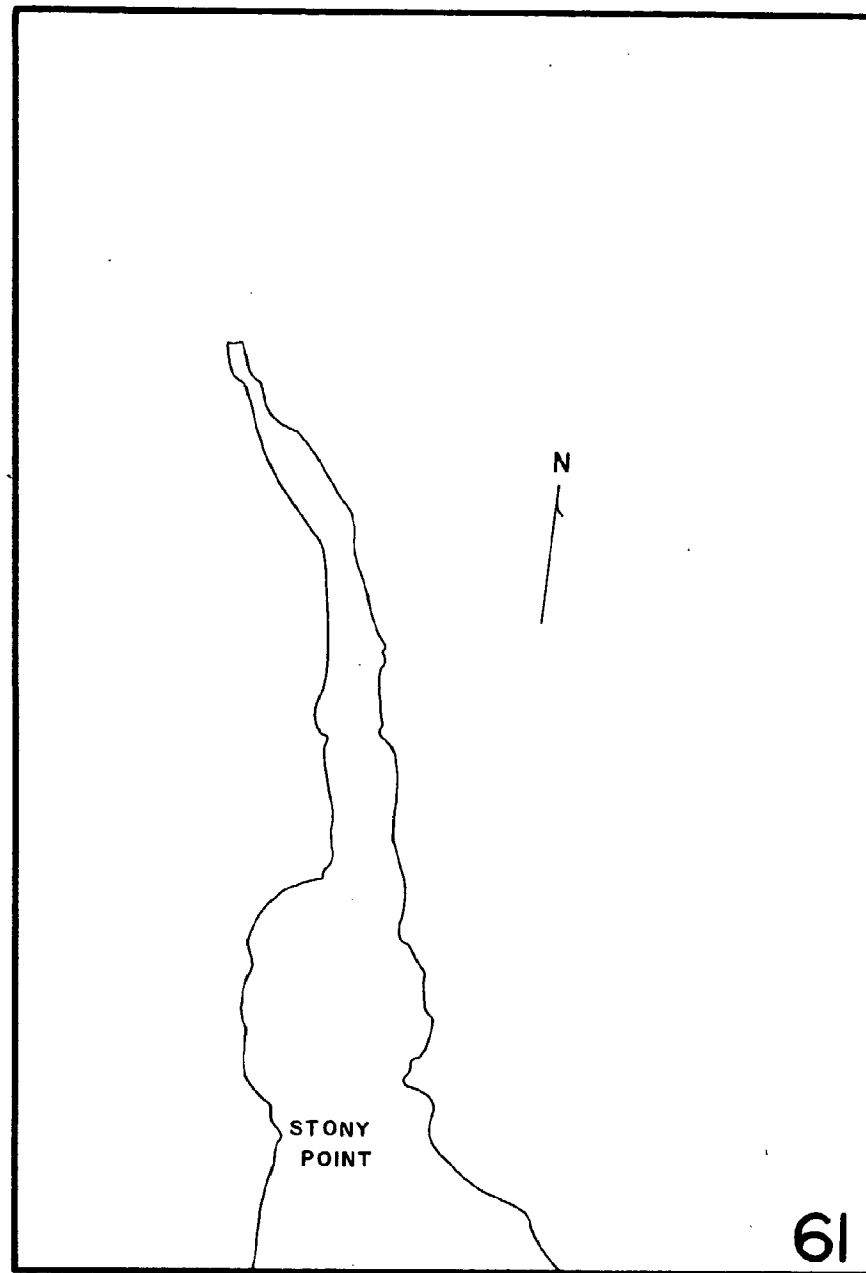
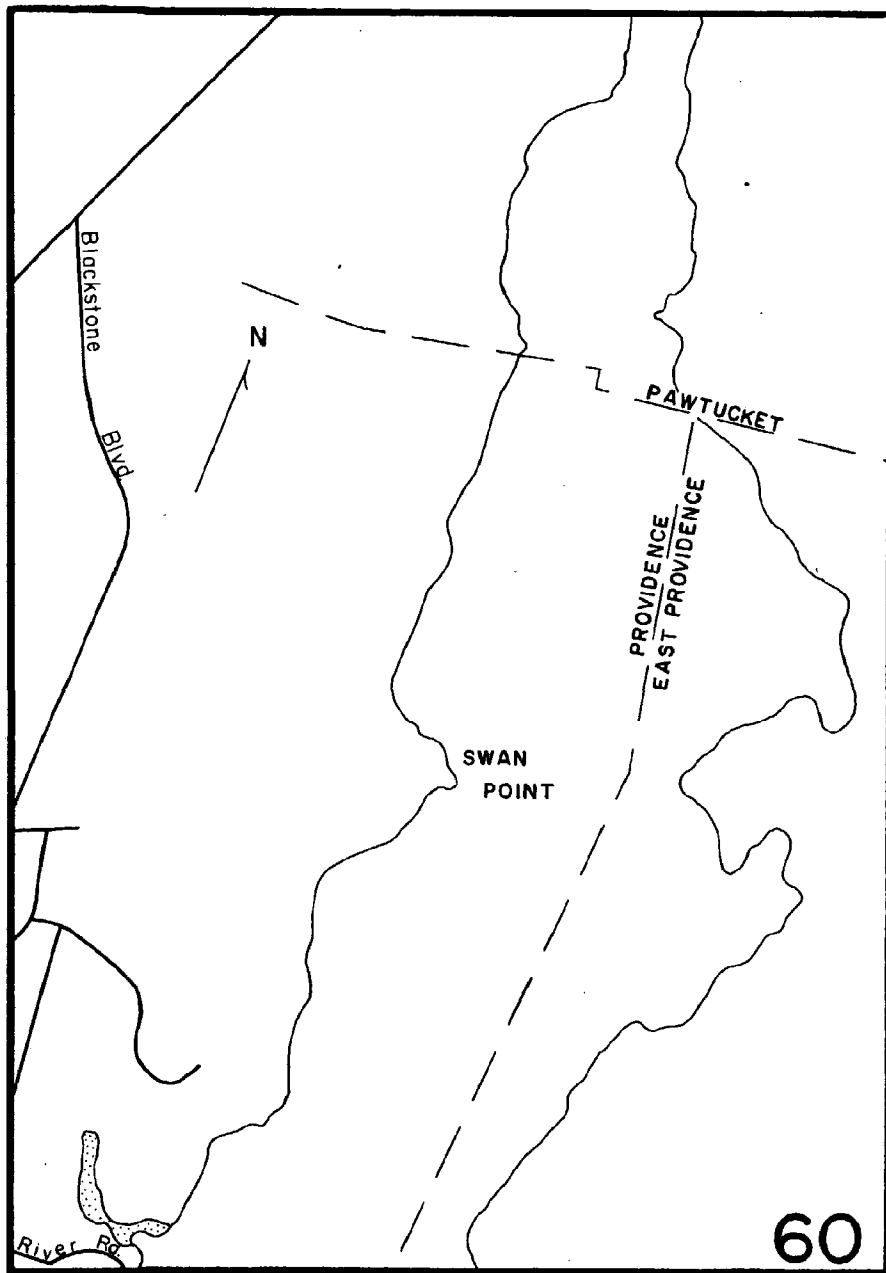


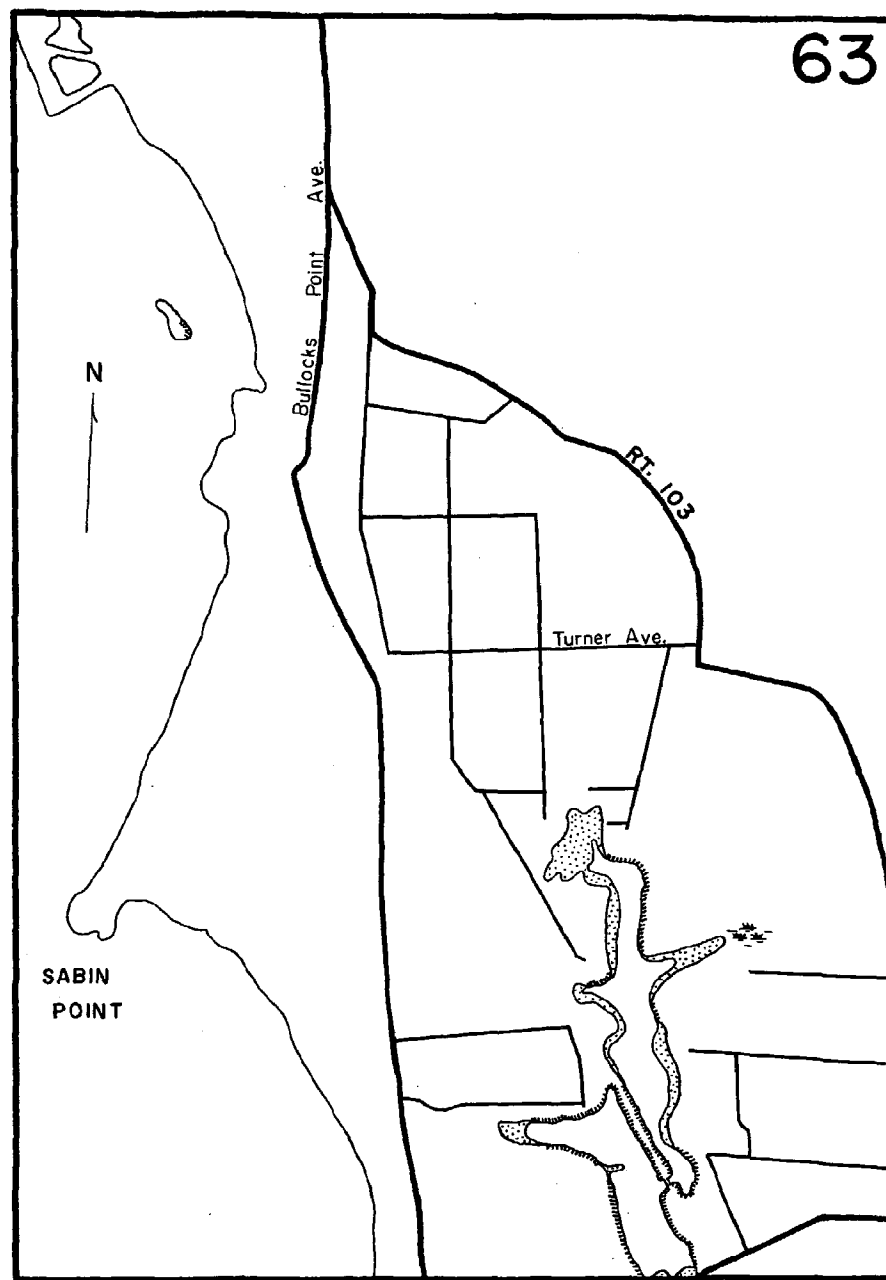
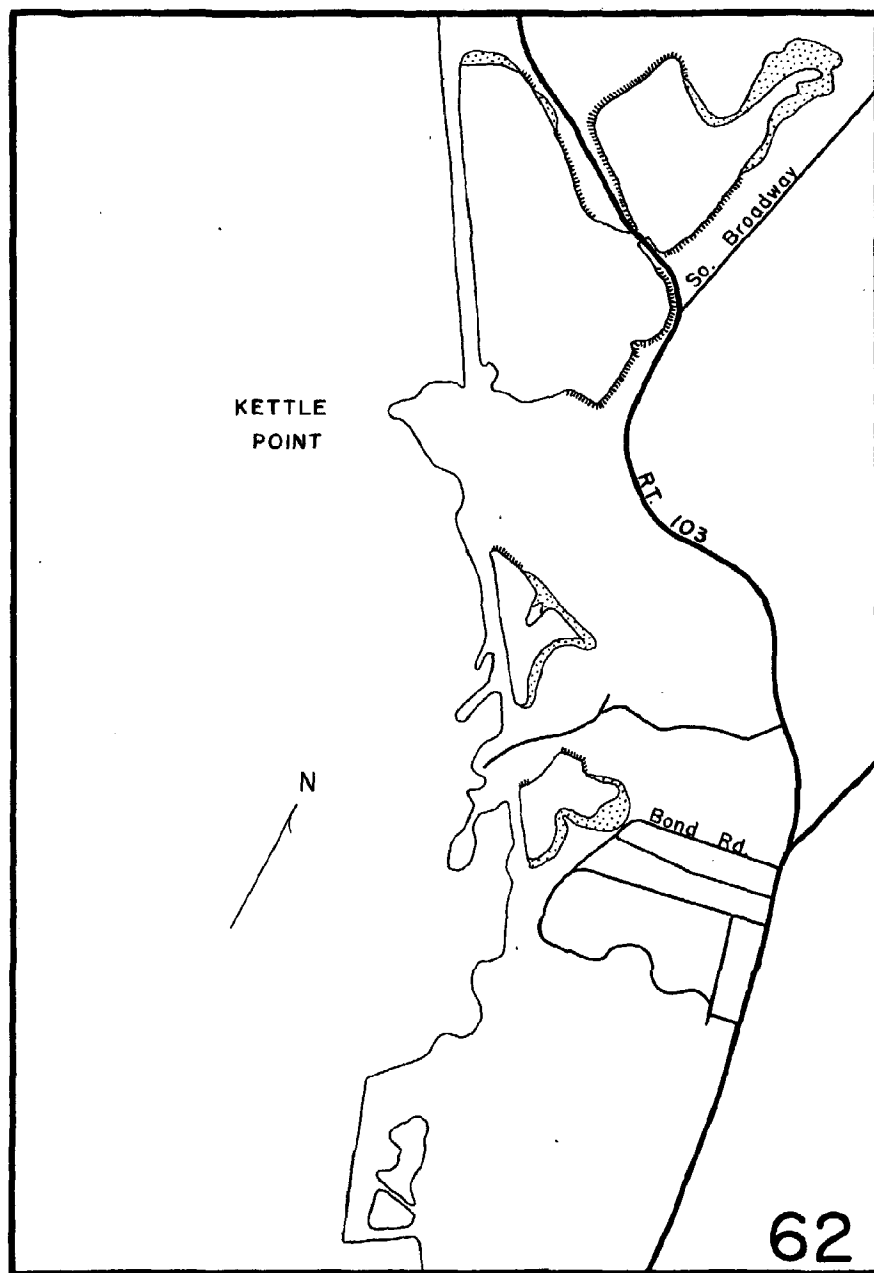


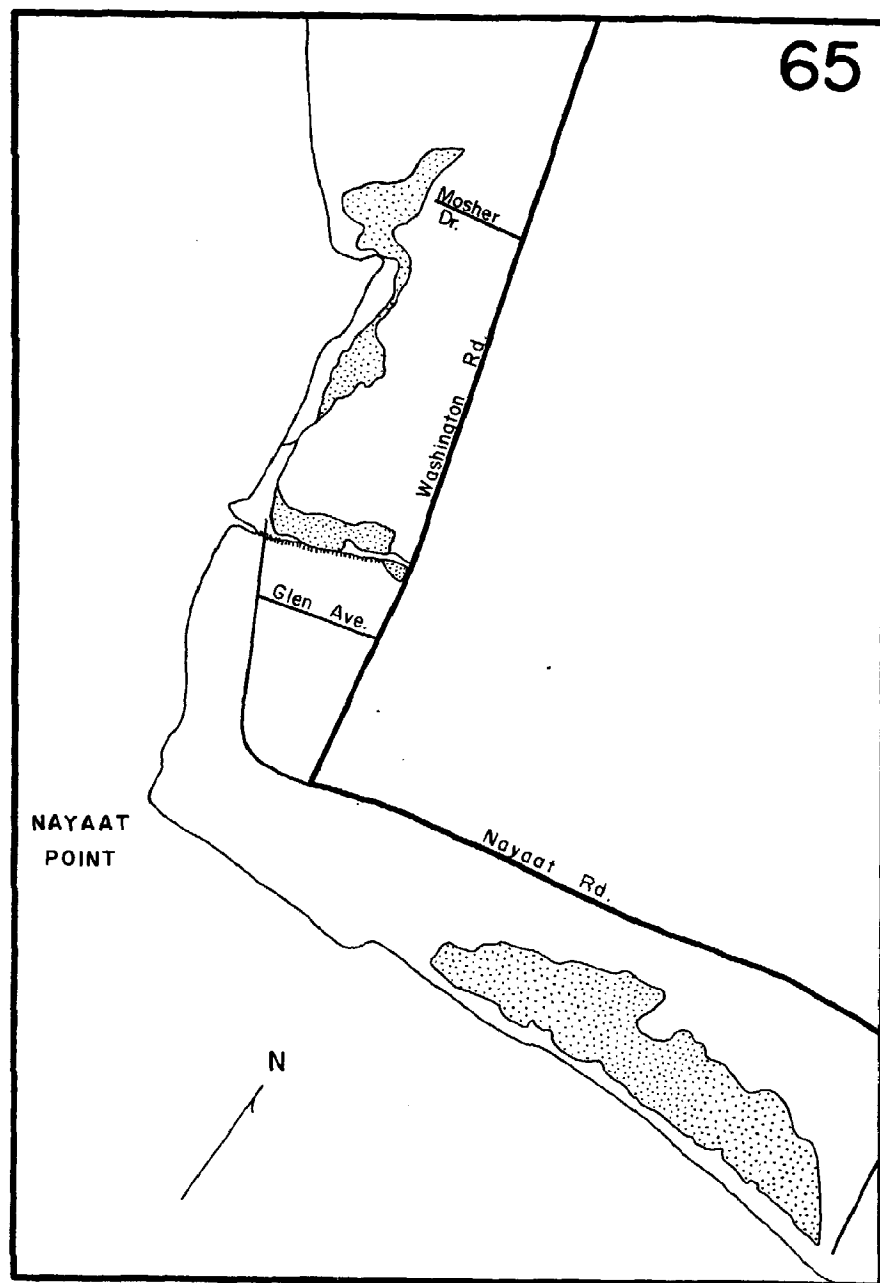
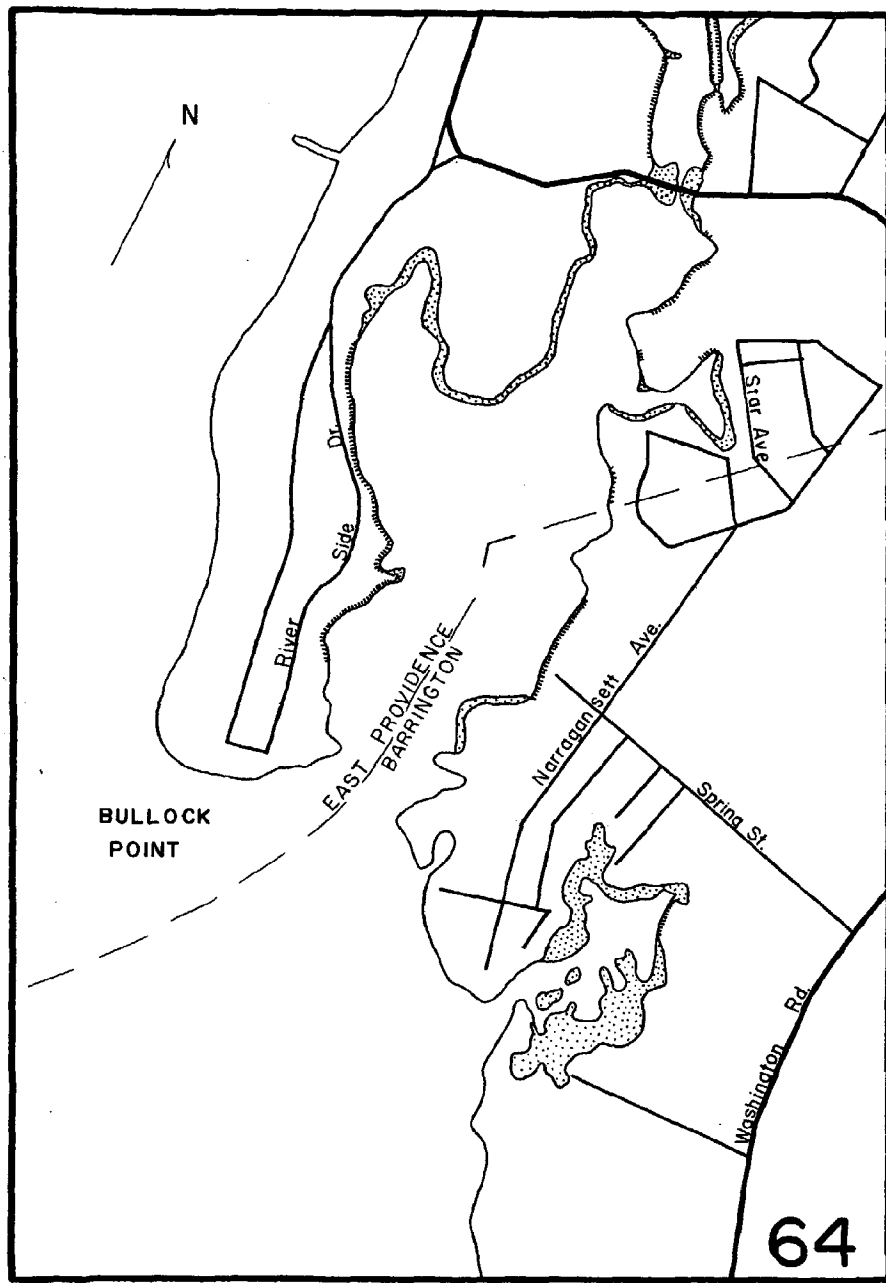


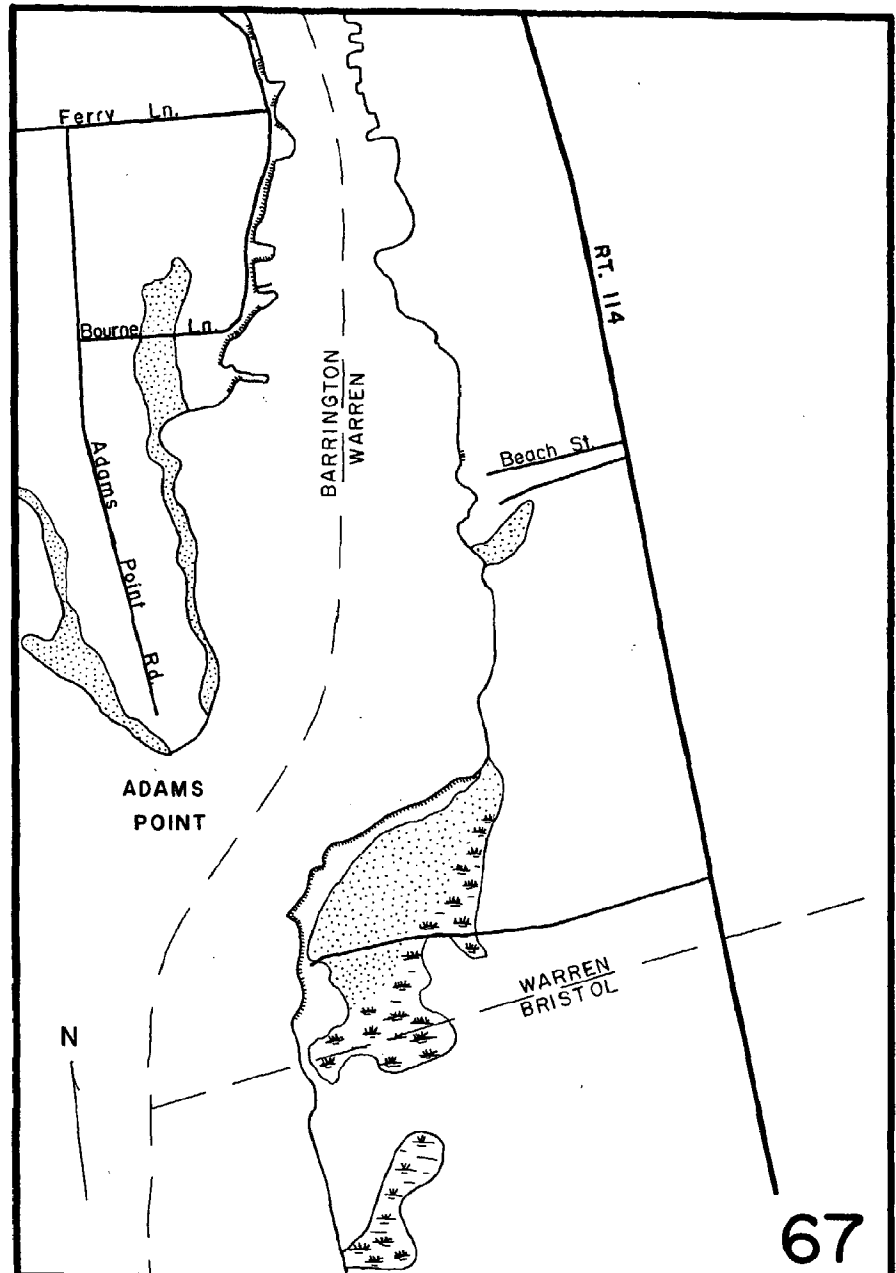




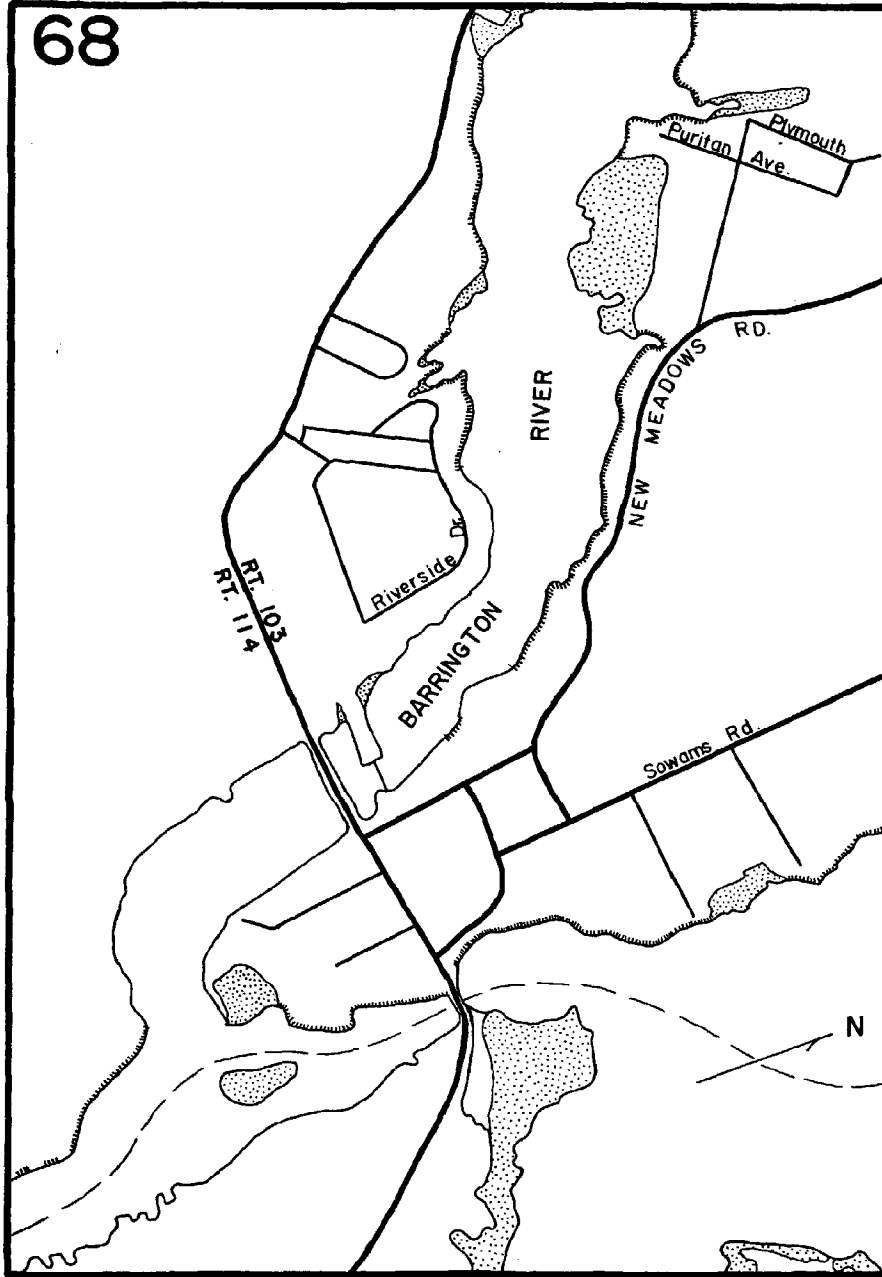




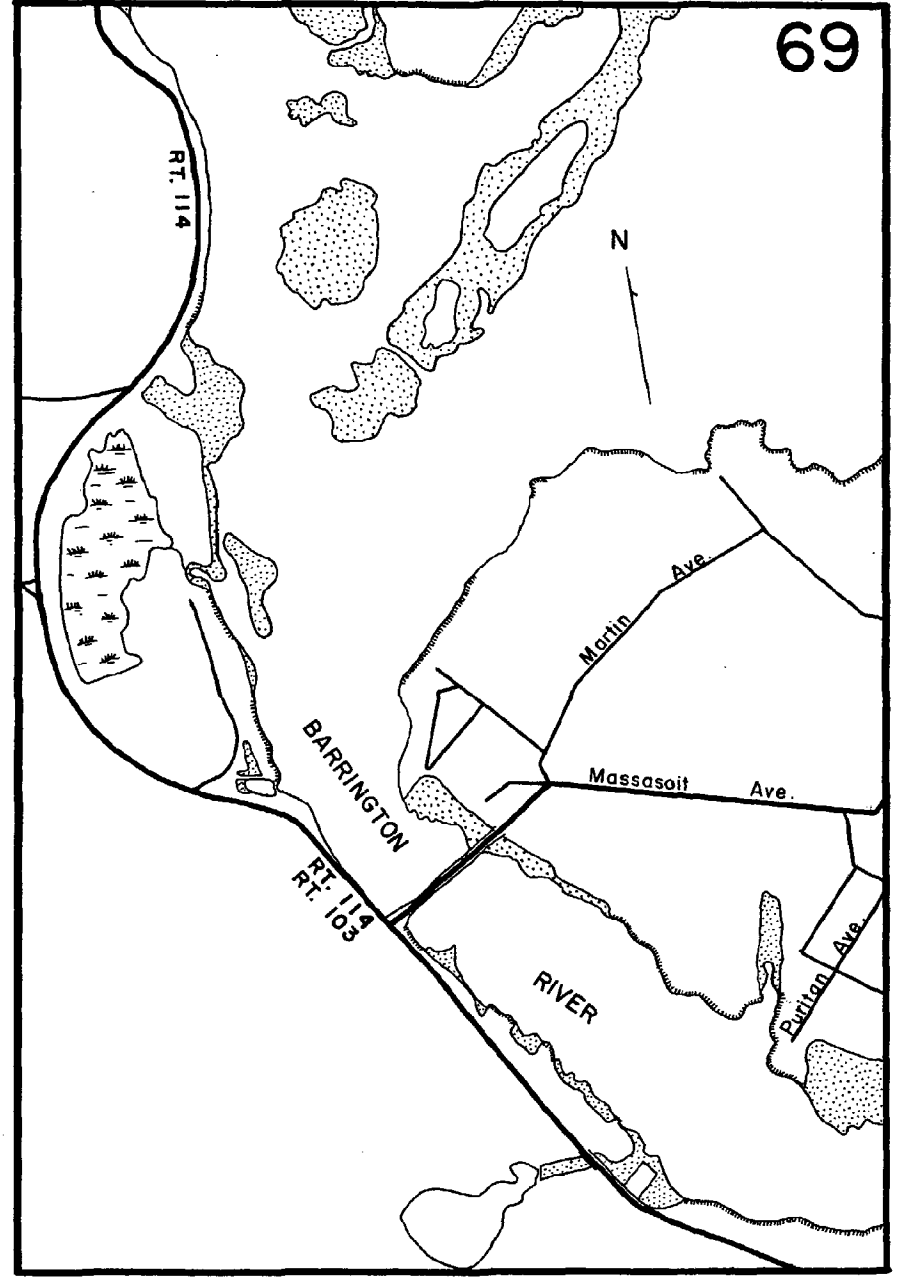


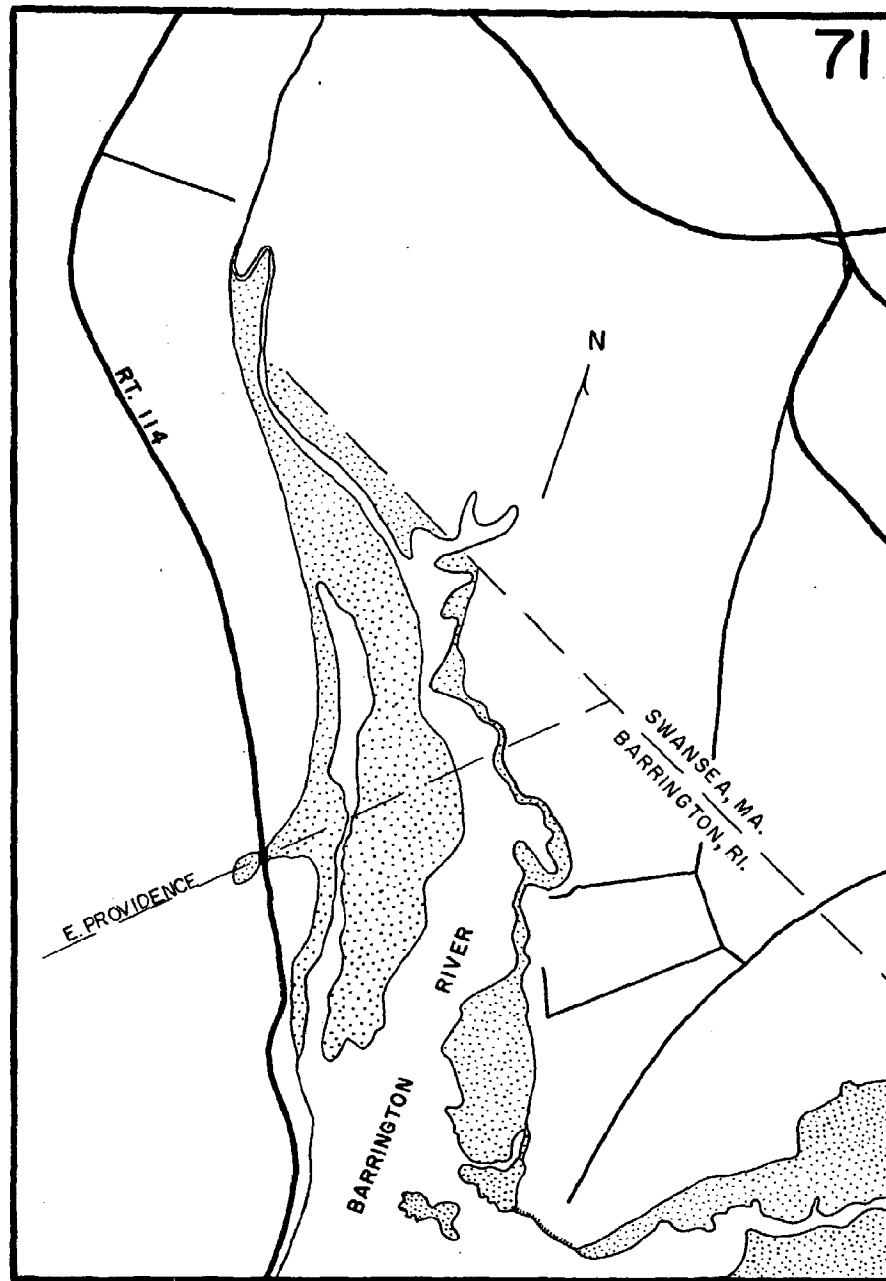
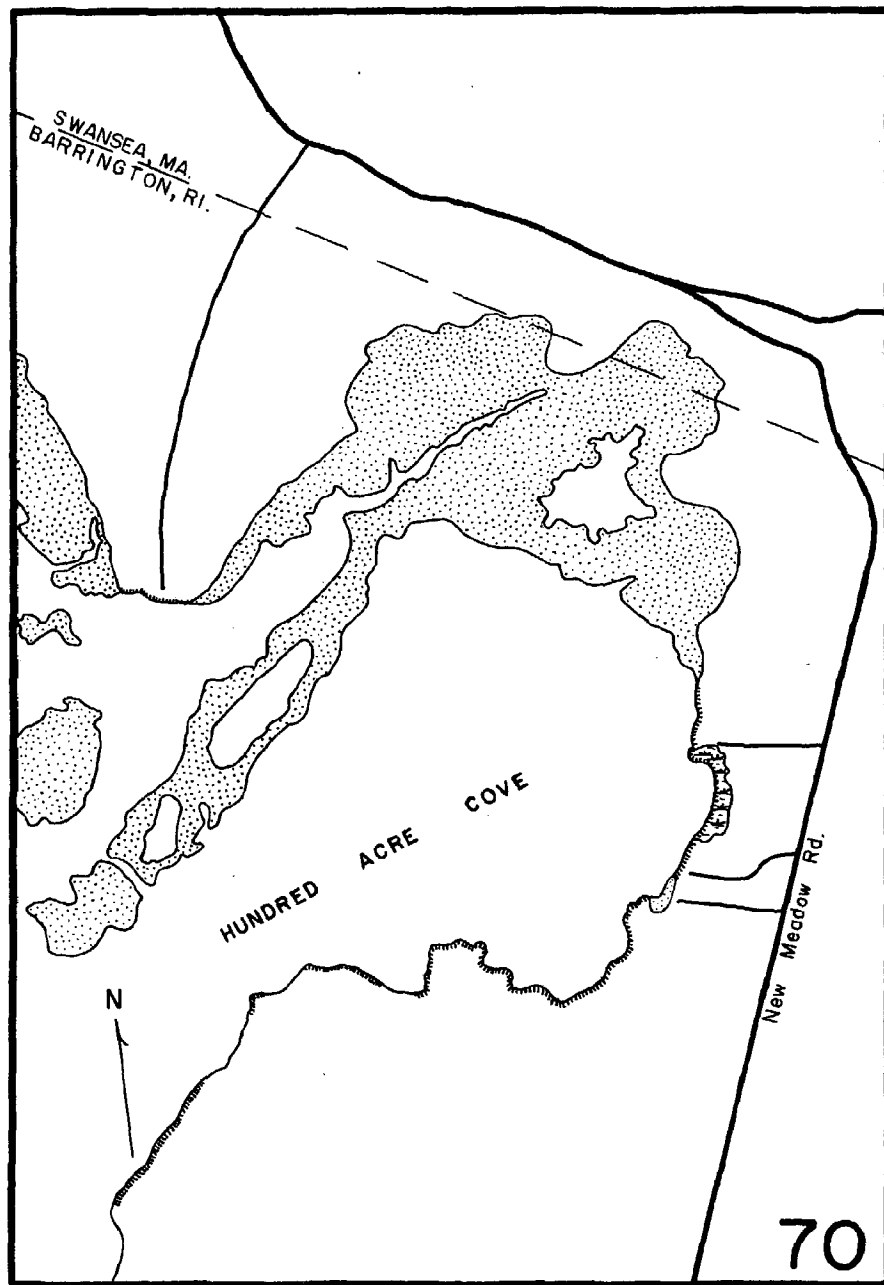


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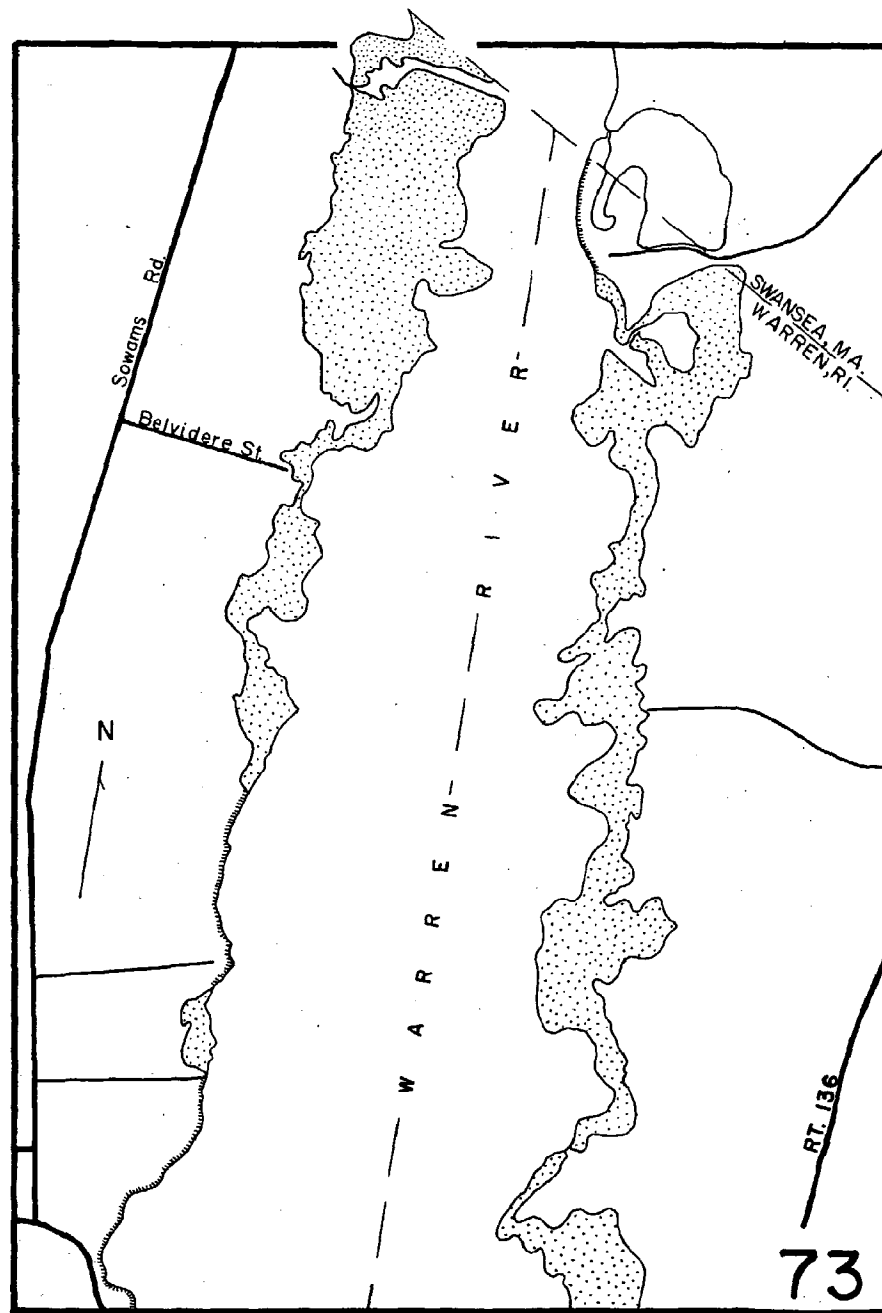
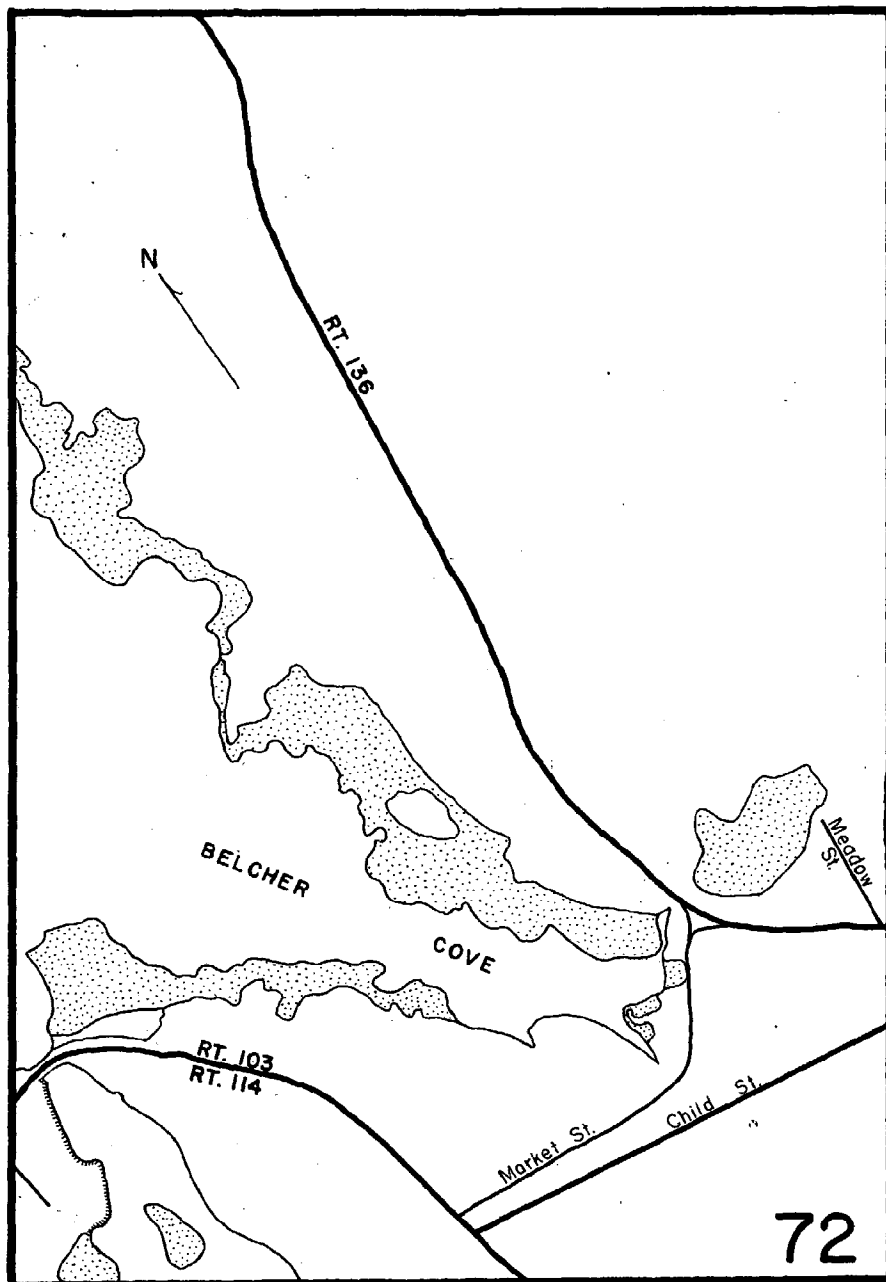


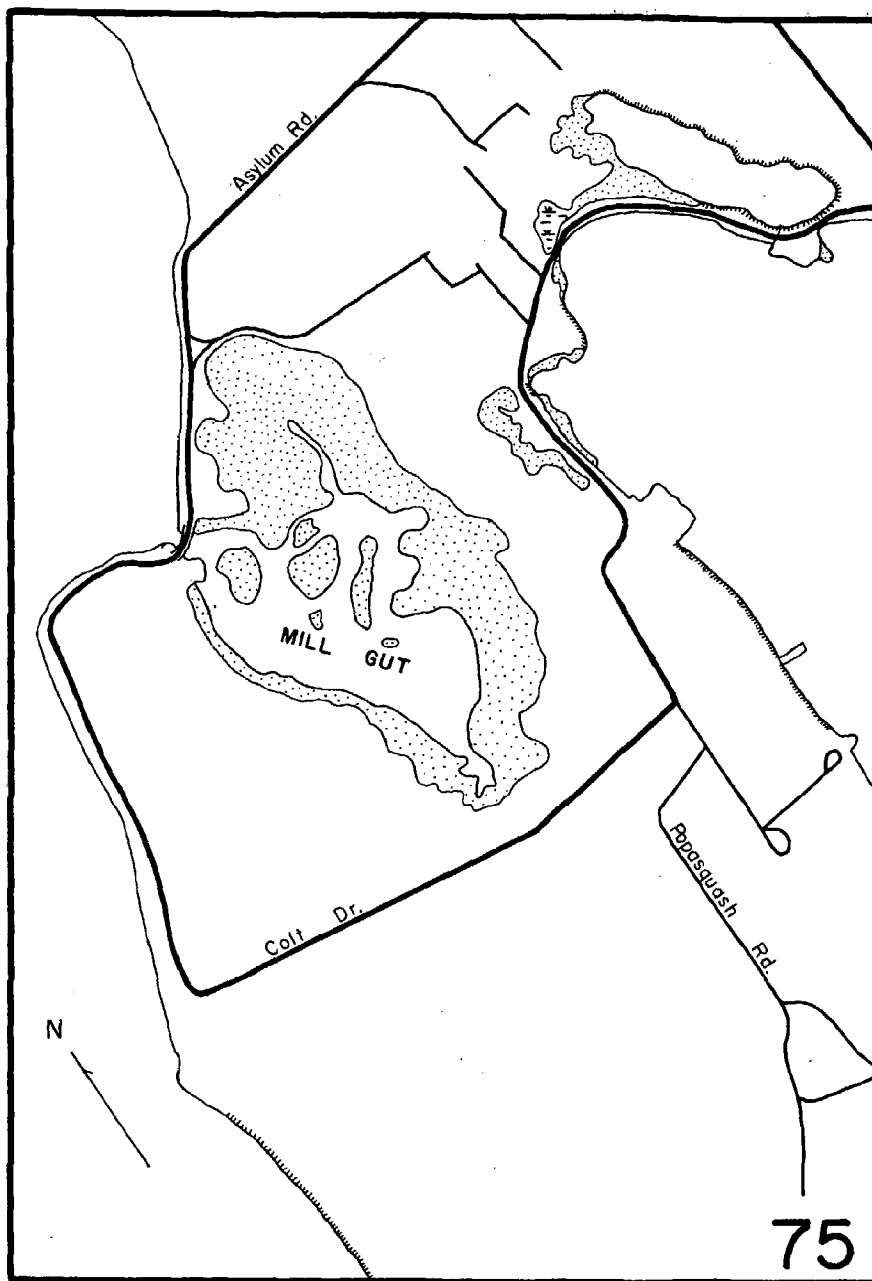
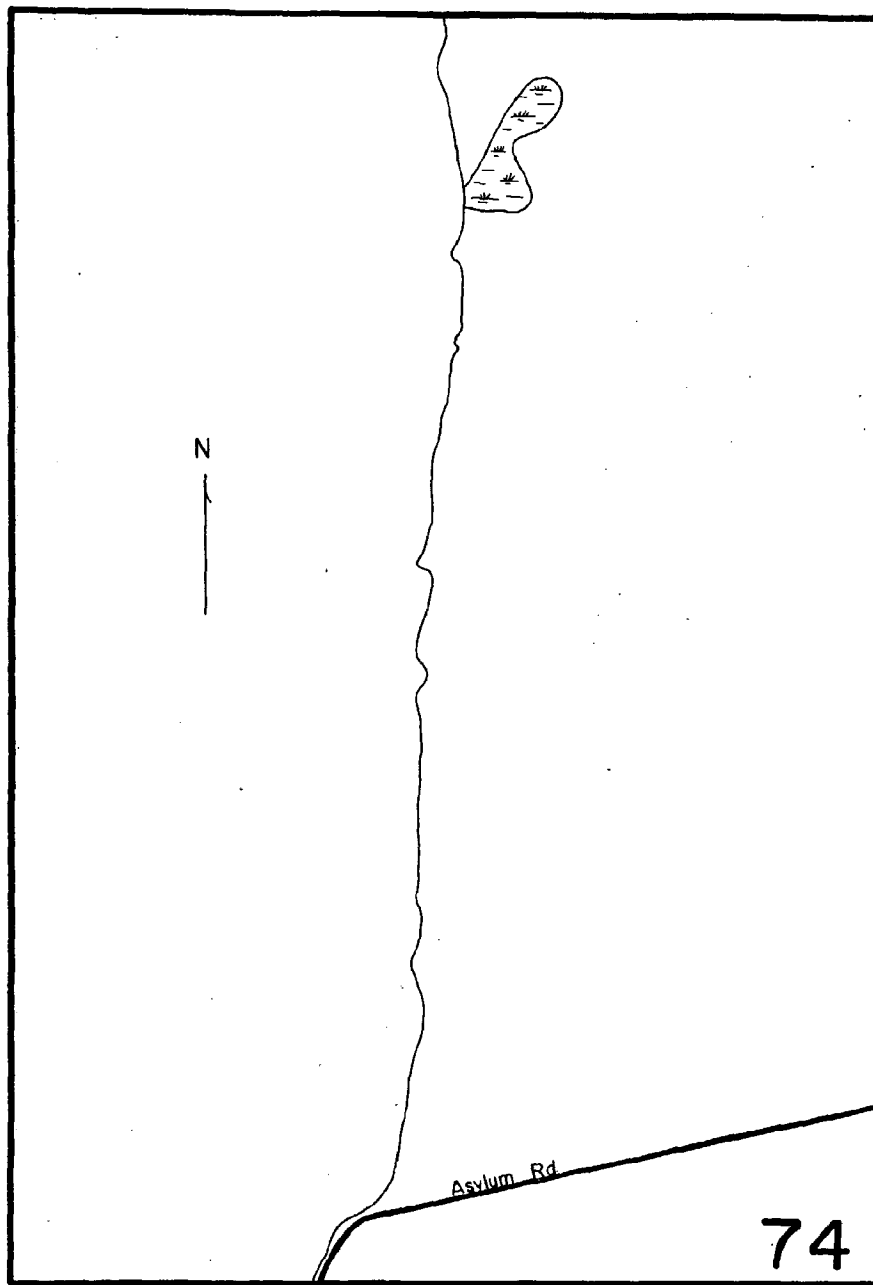
69

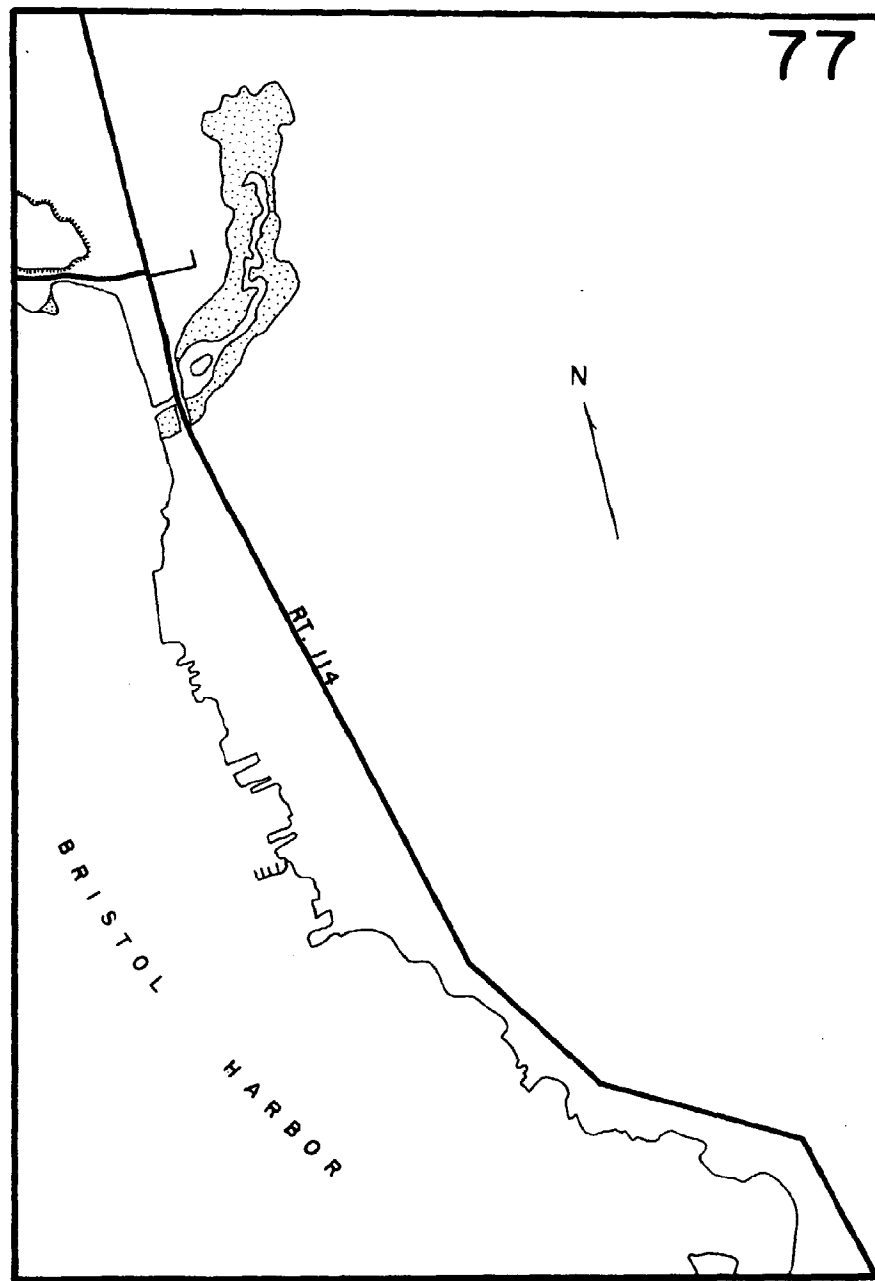
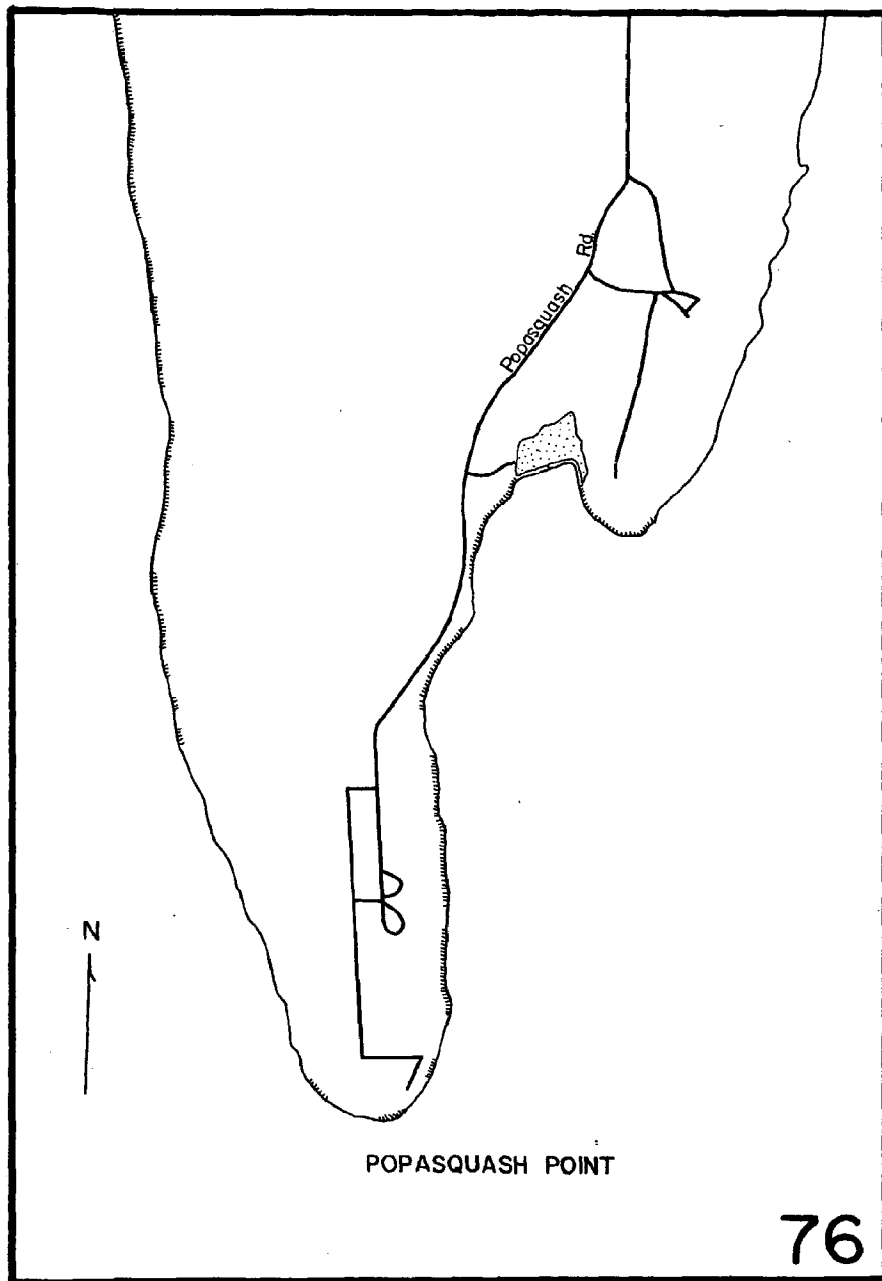


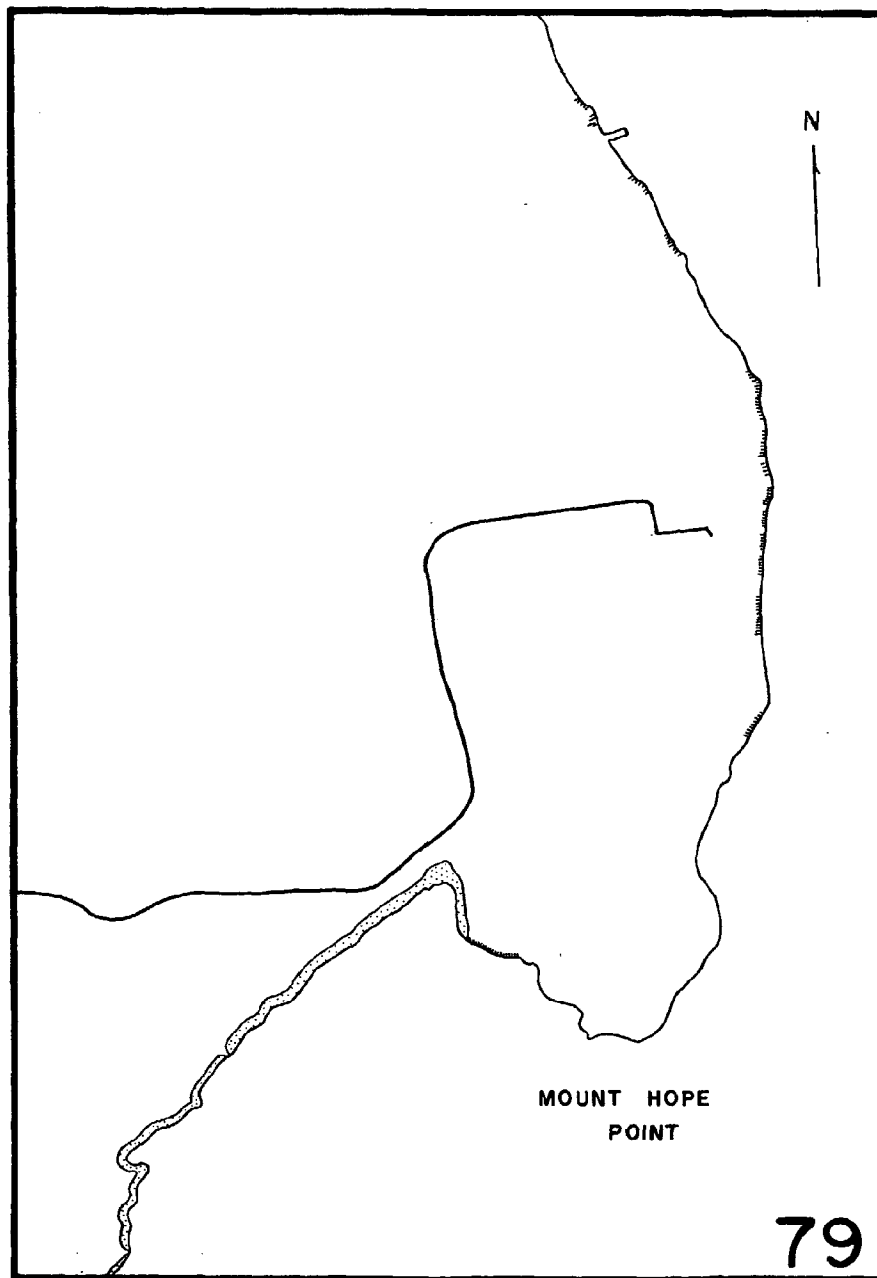
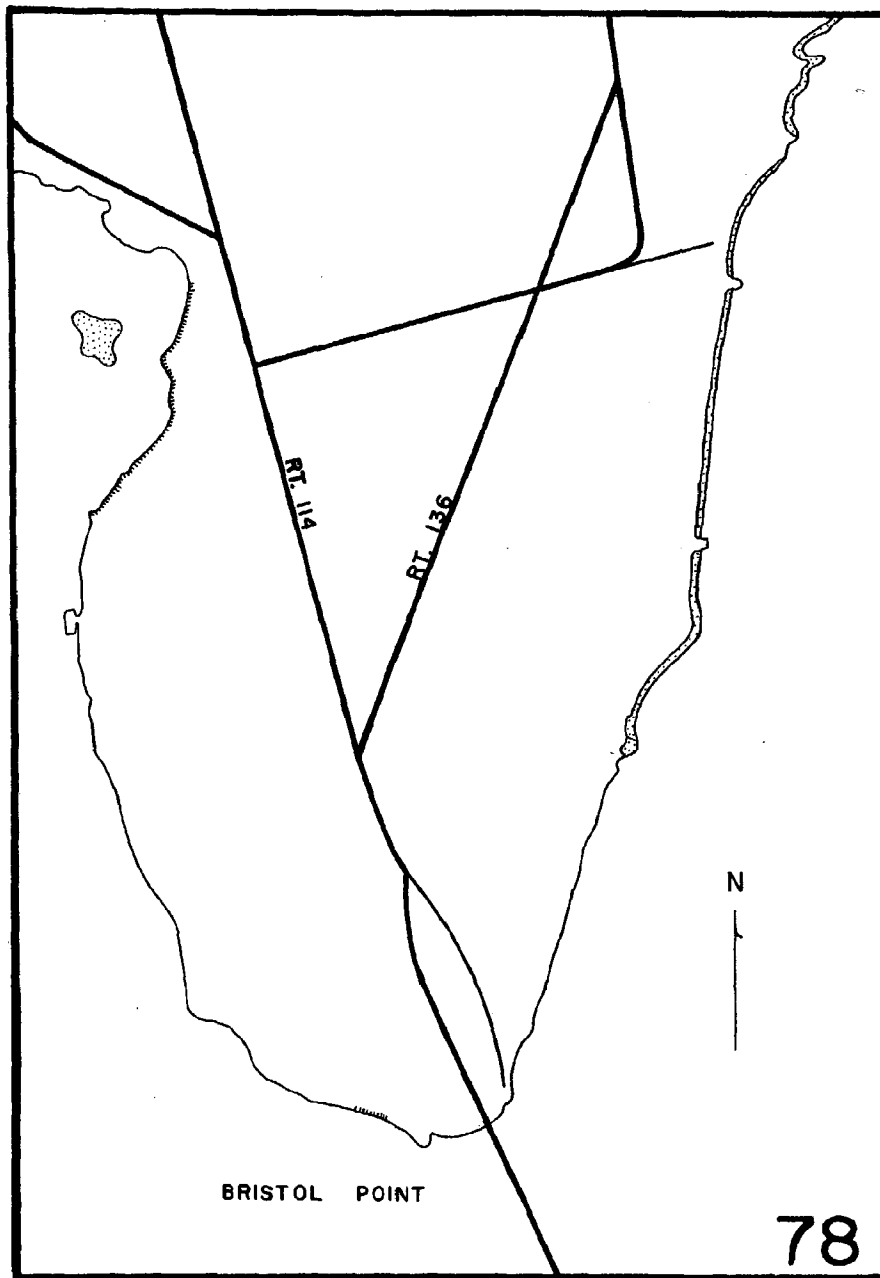


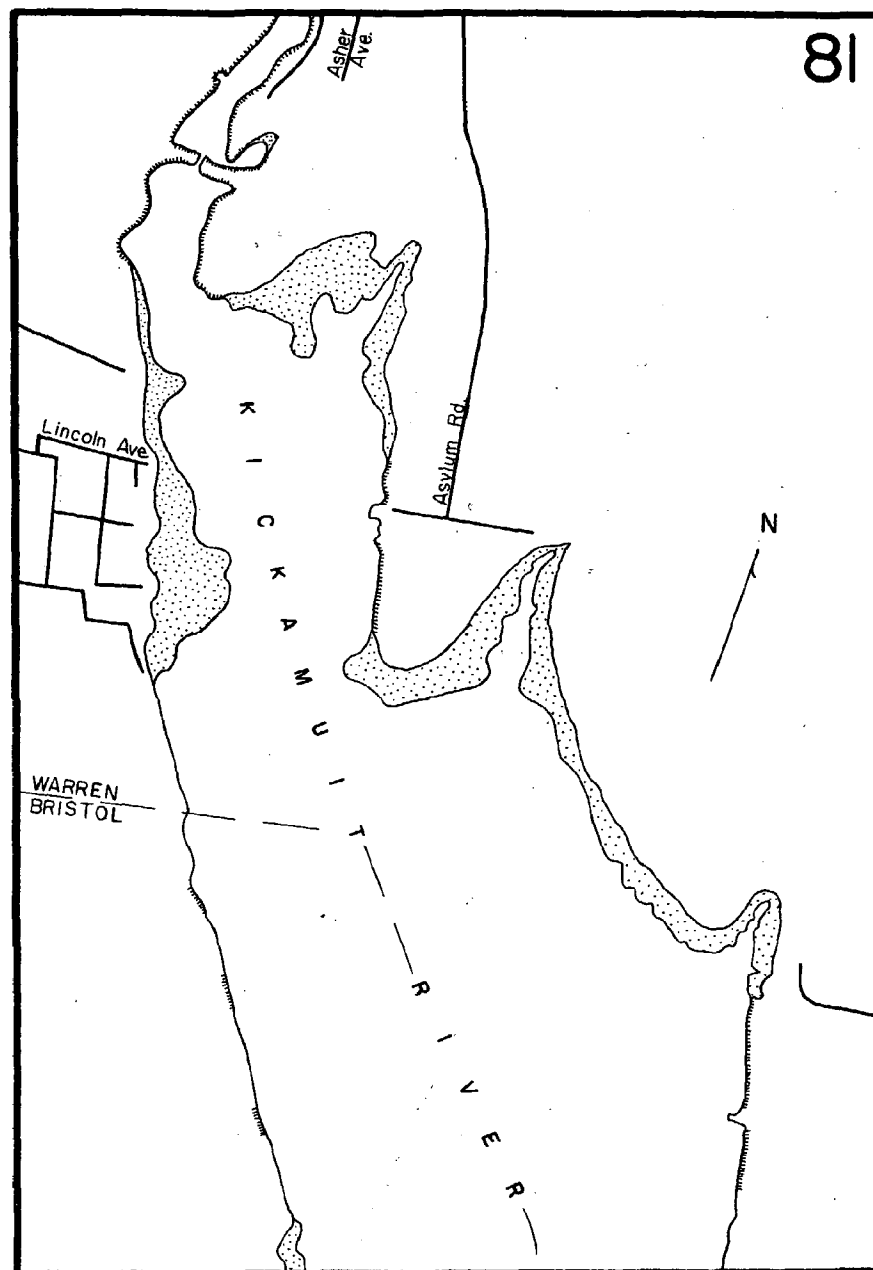
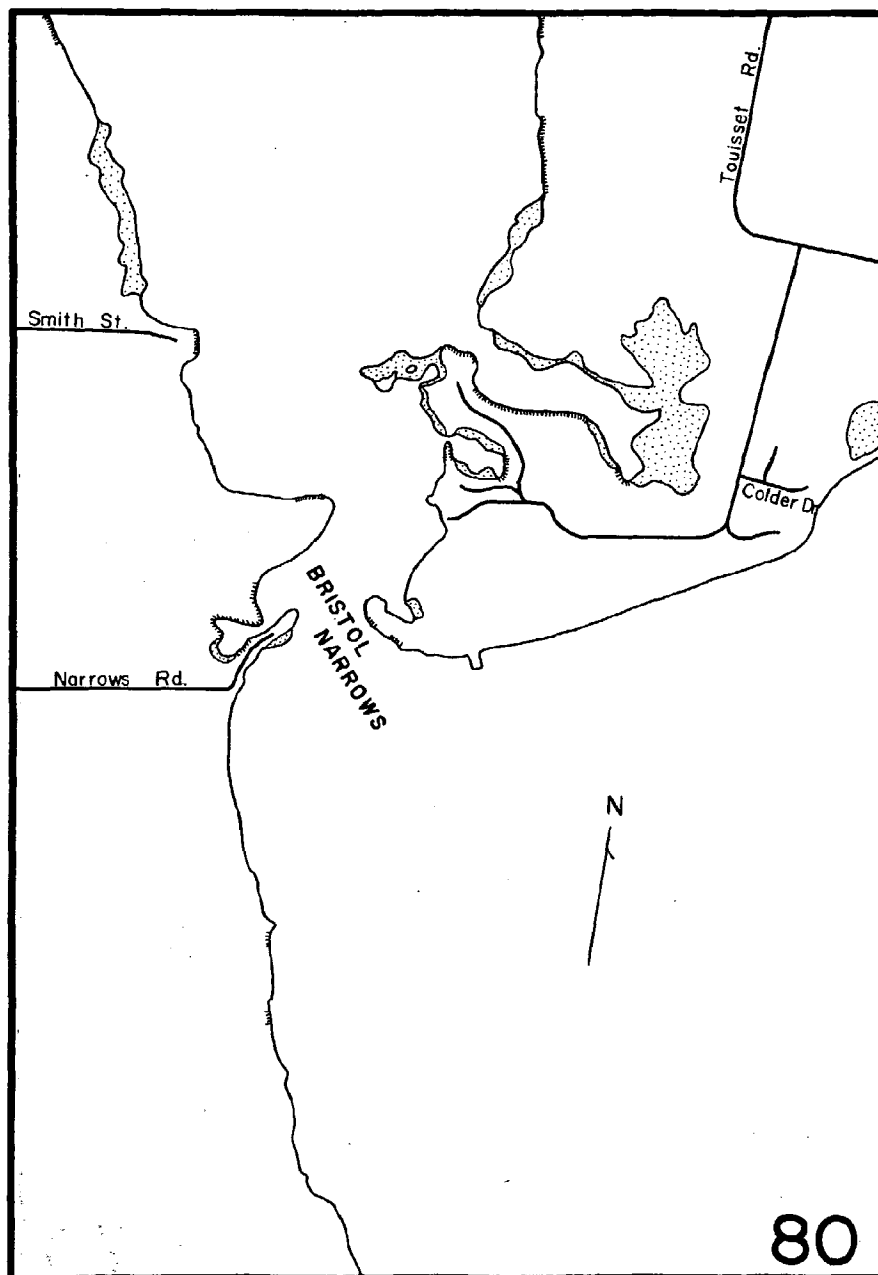


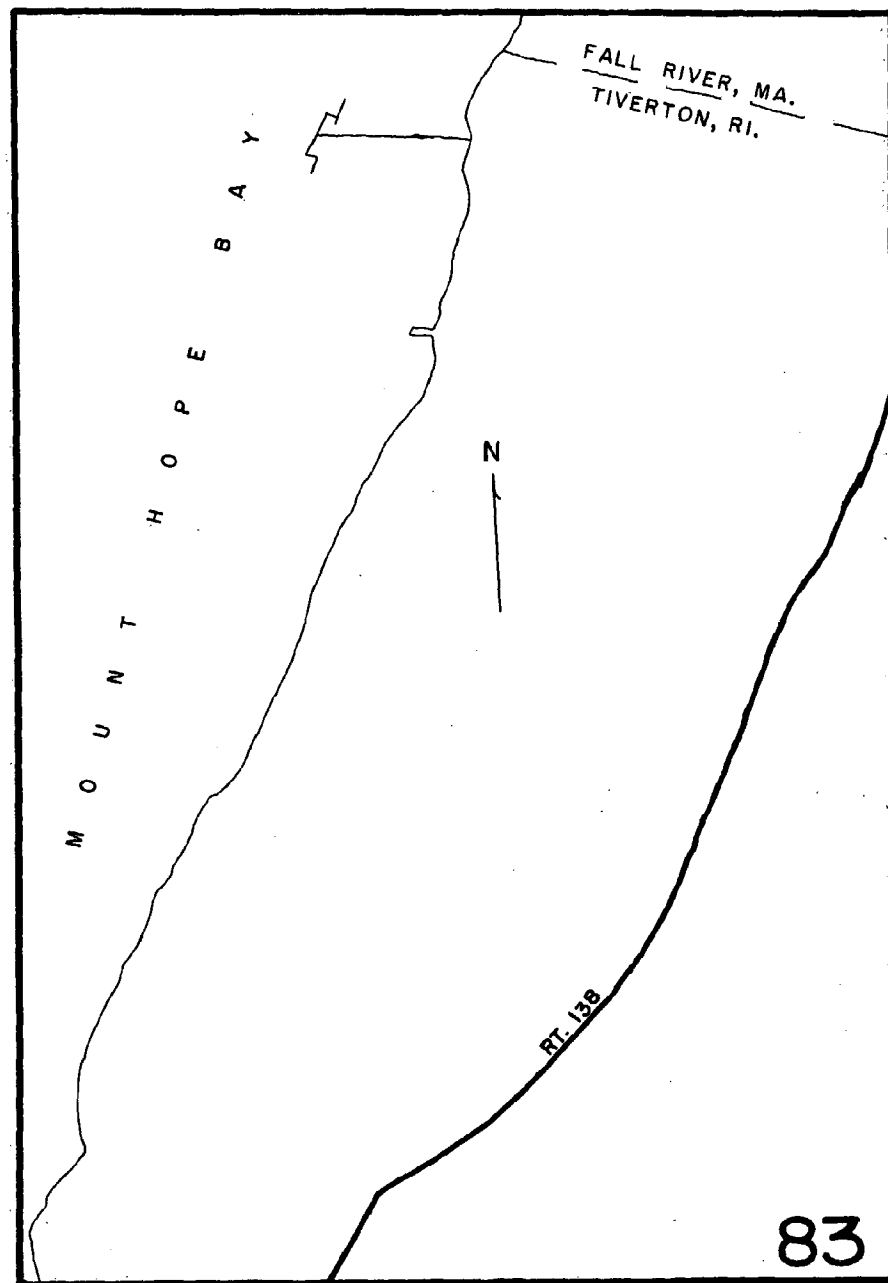
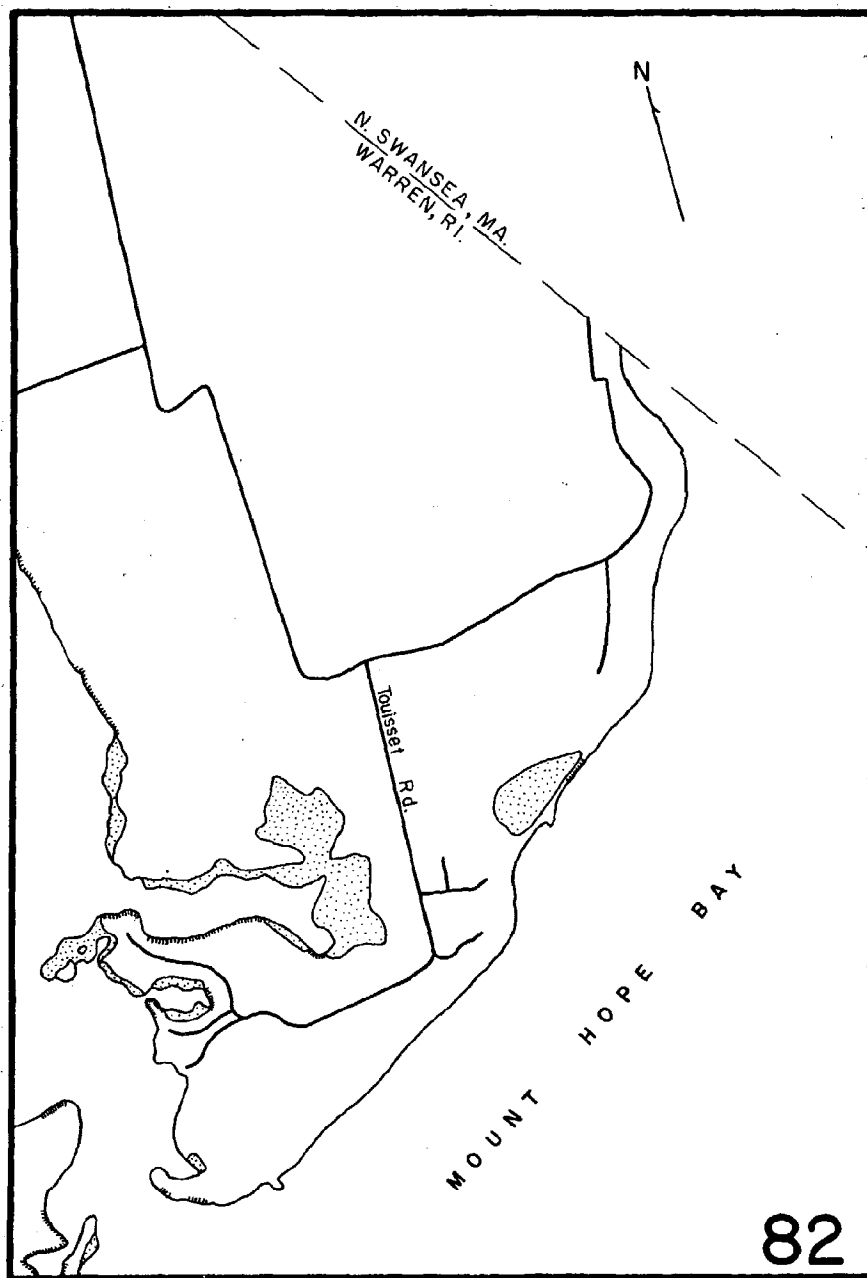


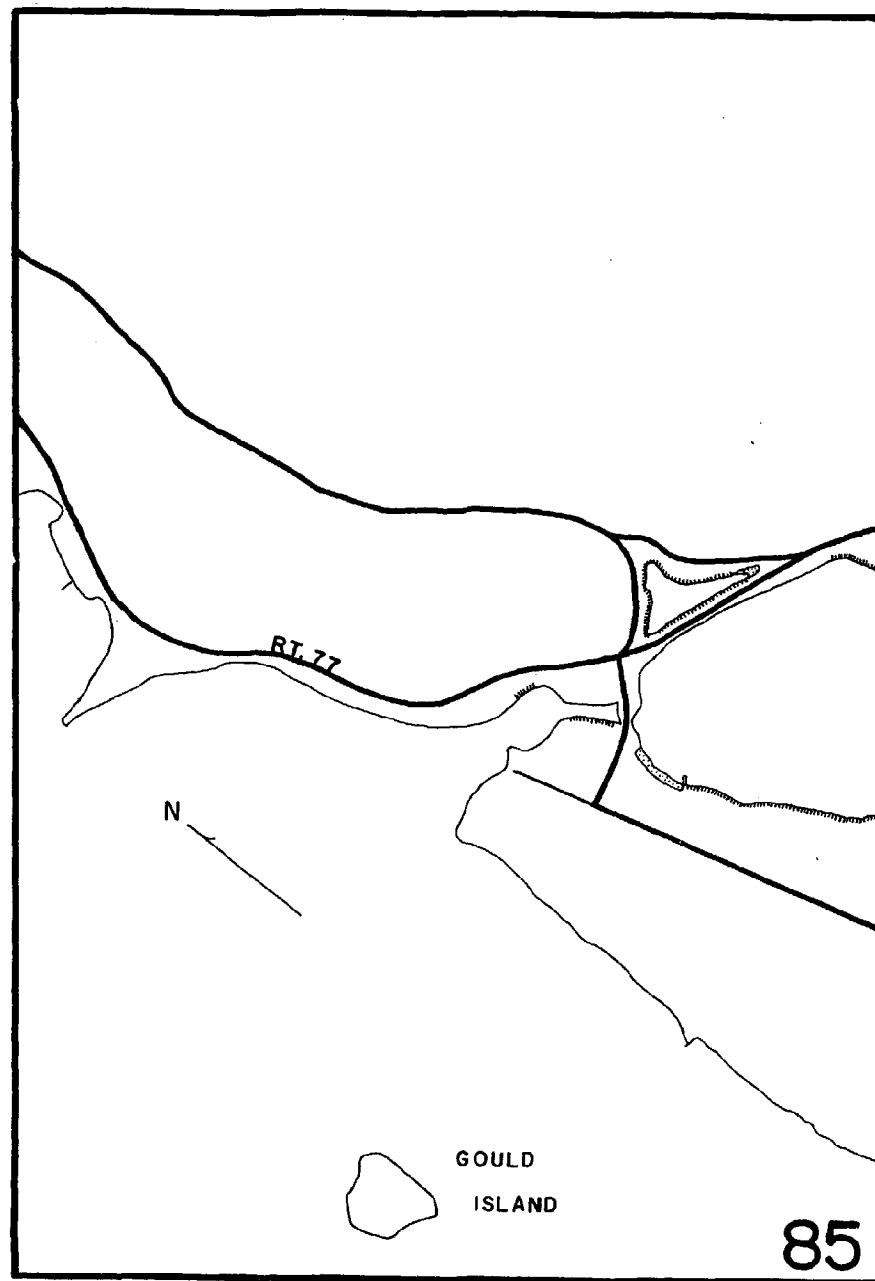
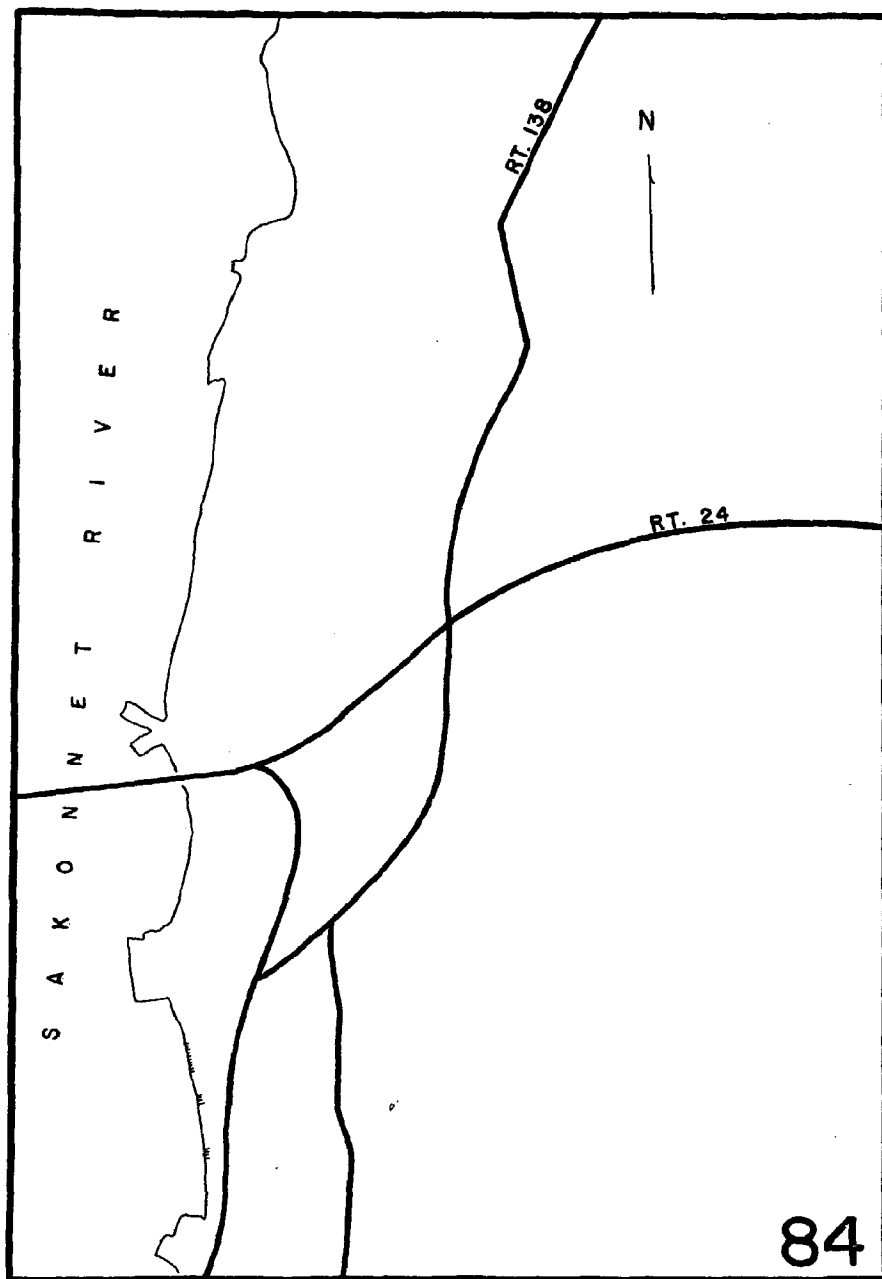


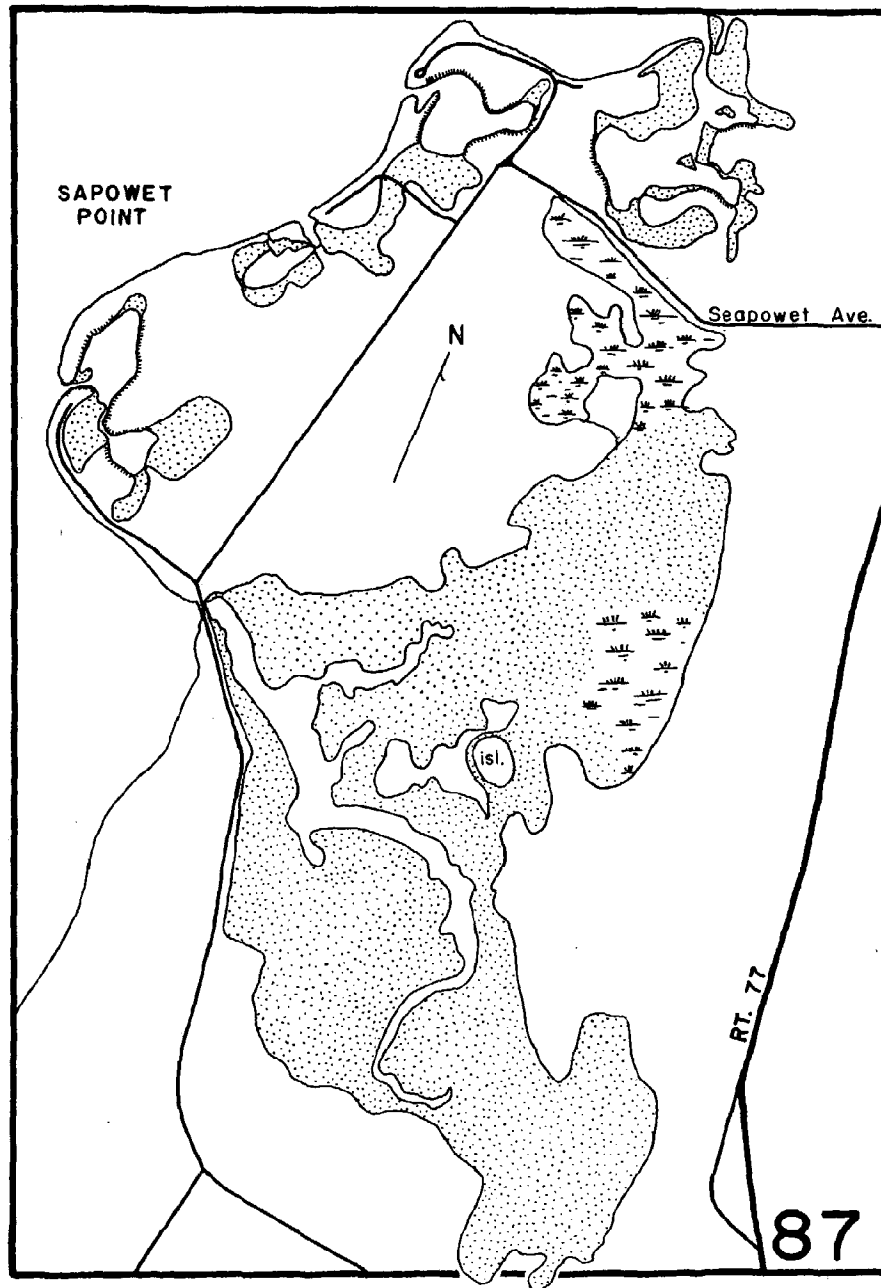
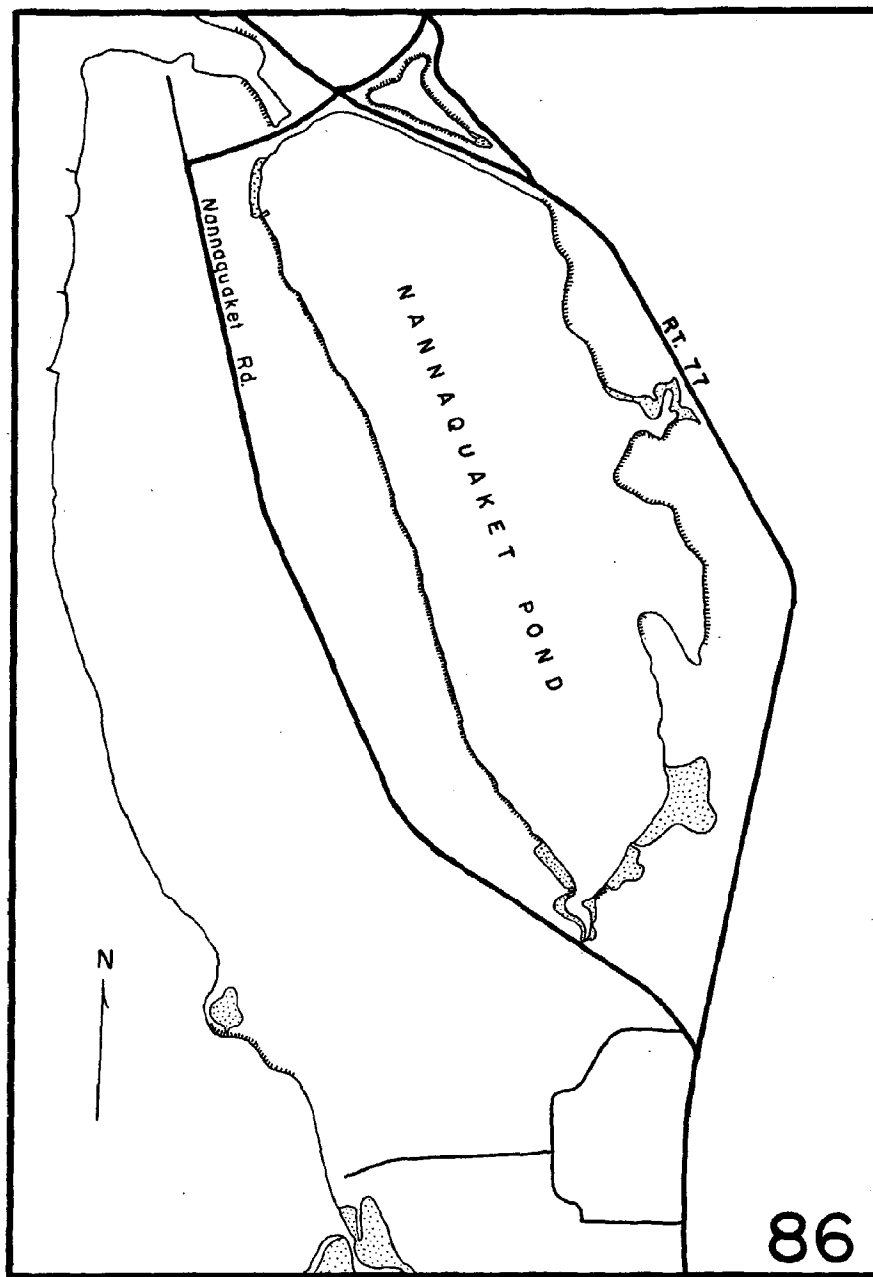














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N O N Q U I T  
P O N D

Puncatest Neck Rd.

N ———

FOGLAND  
POINT

Fogland Rd

LITTLE COMPTON  
TINERION

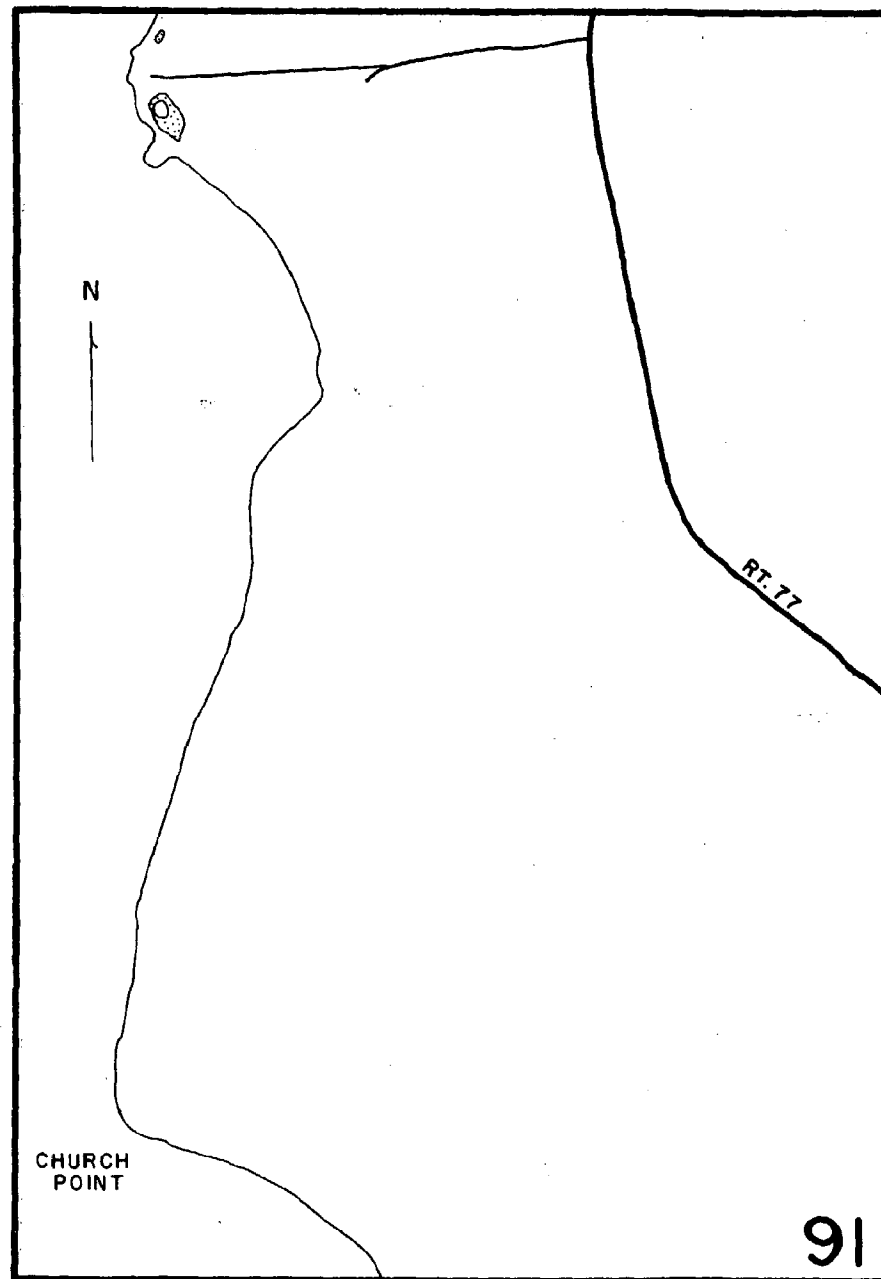
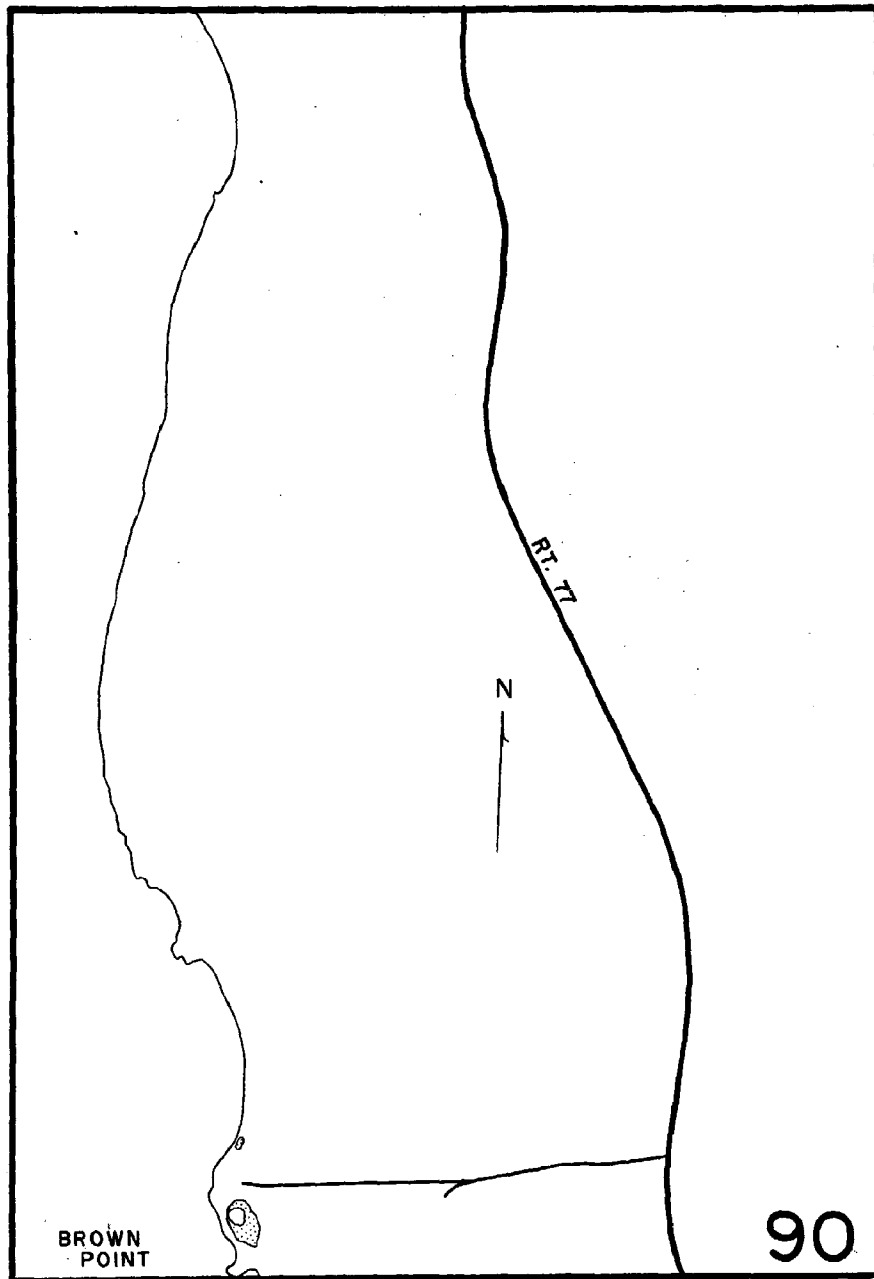
RT. 77

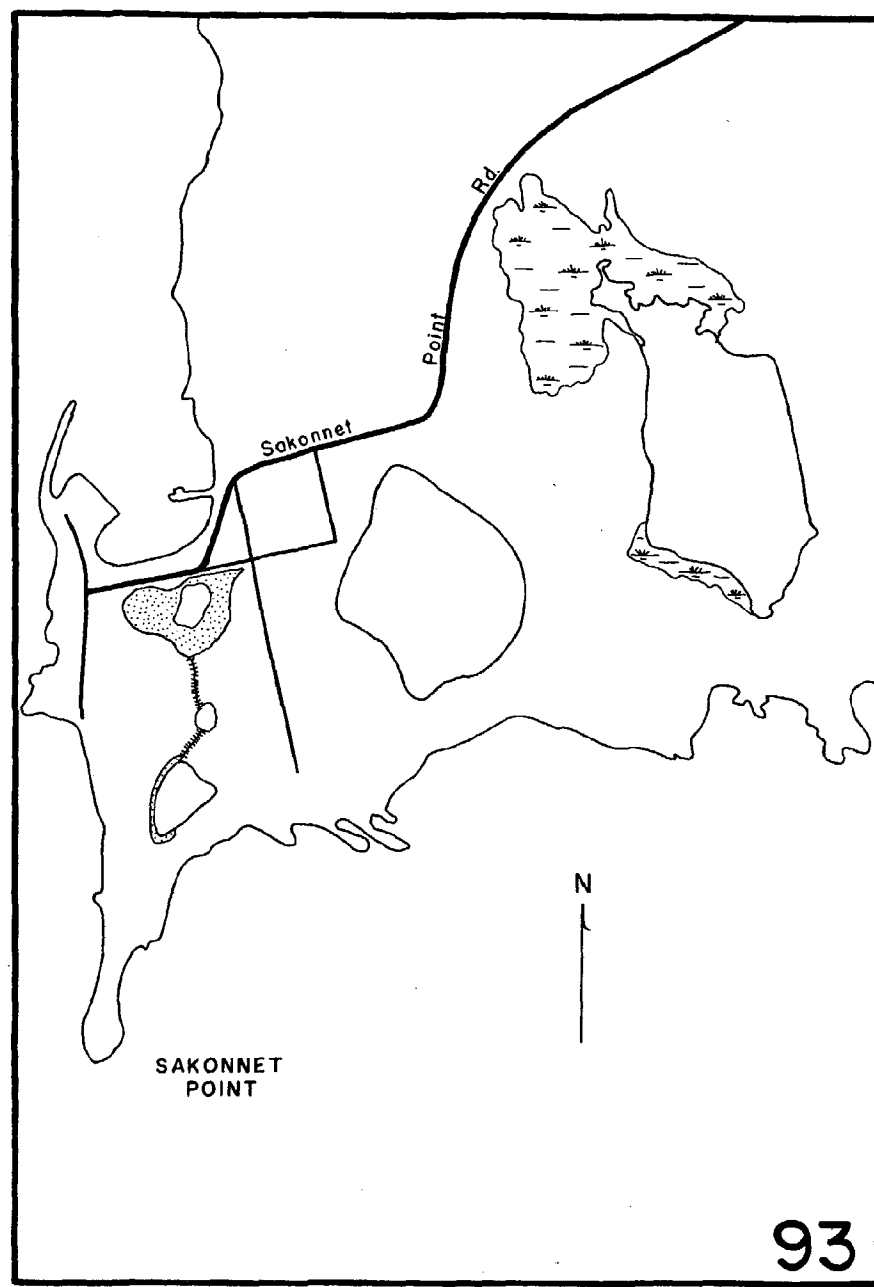
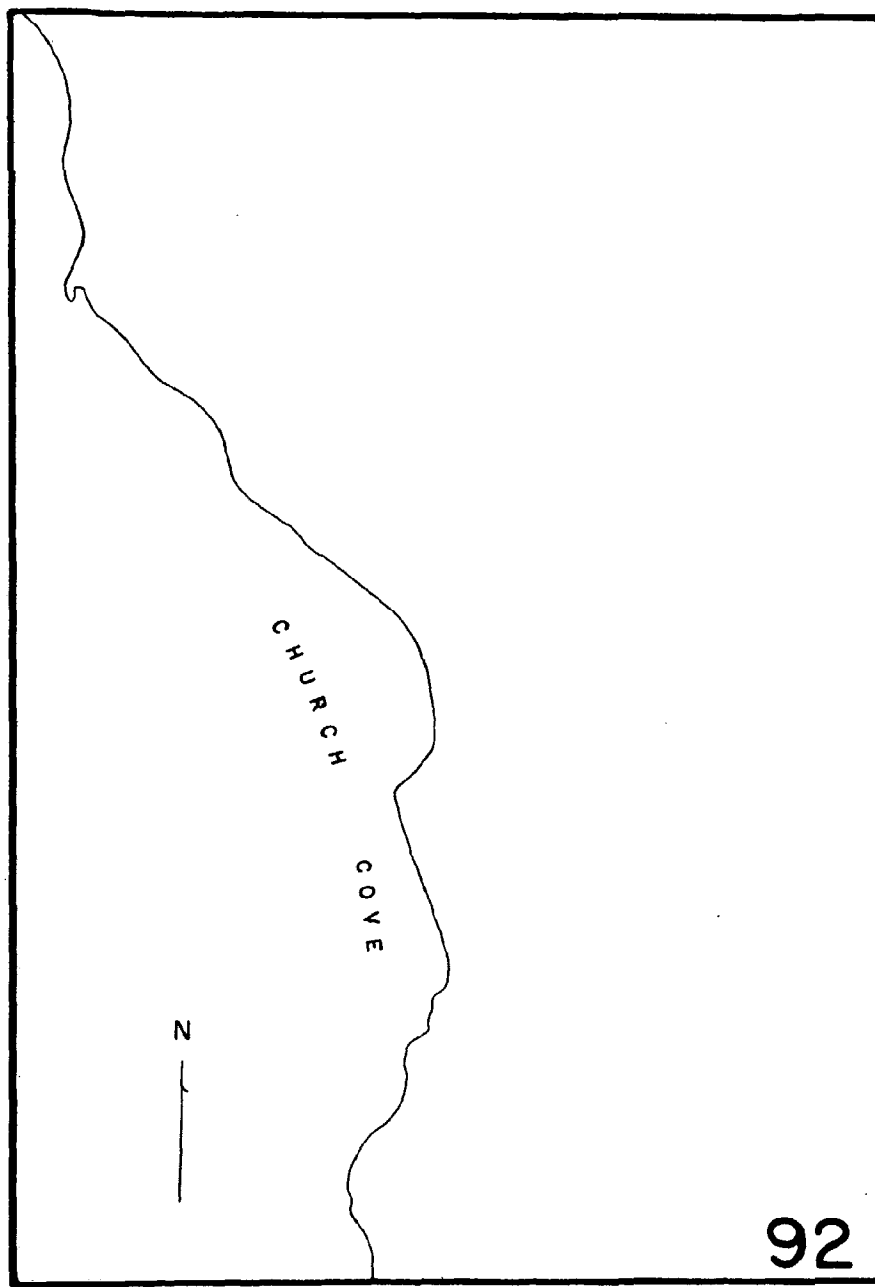
Pond Bridge Rd.

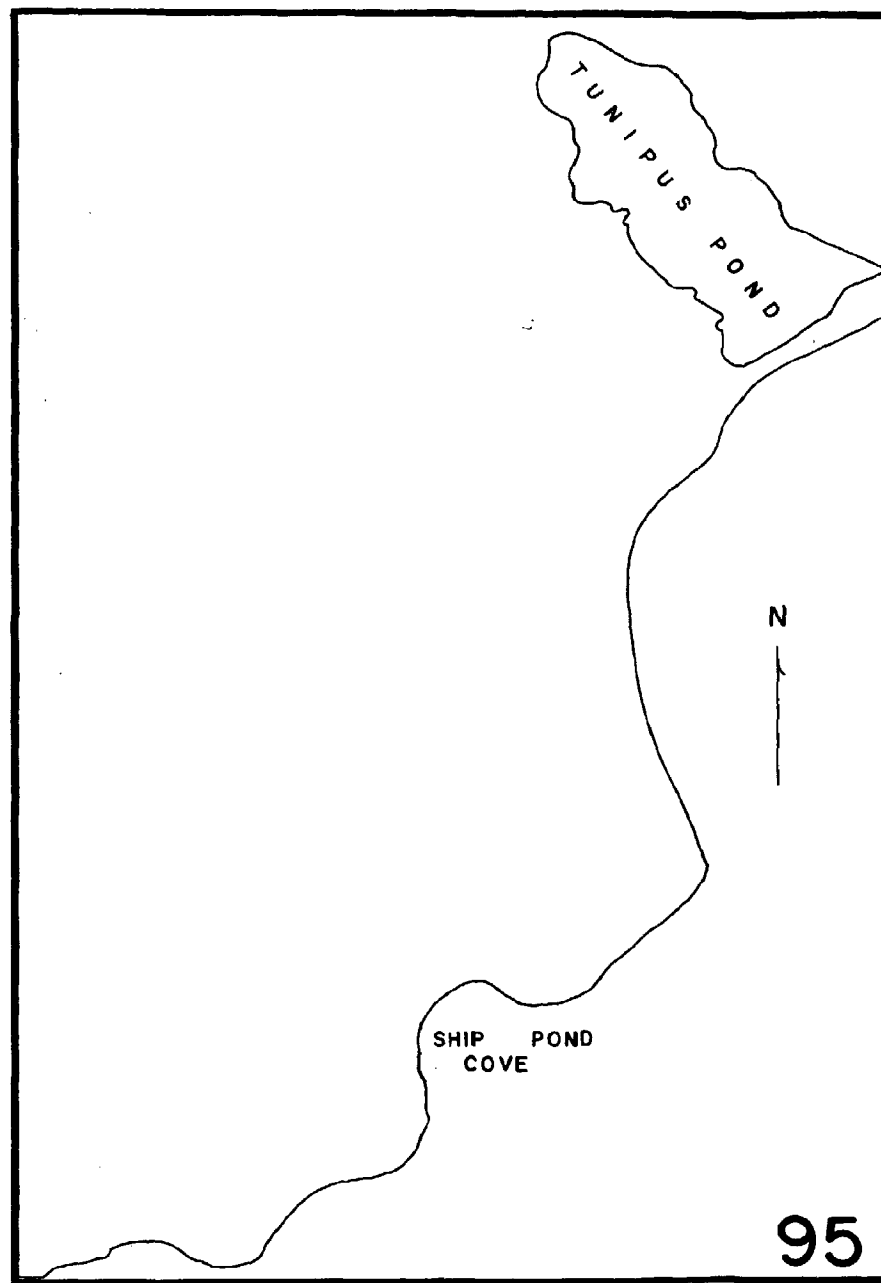
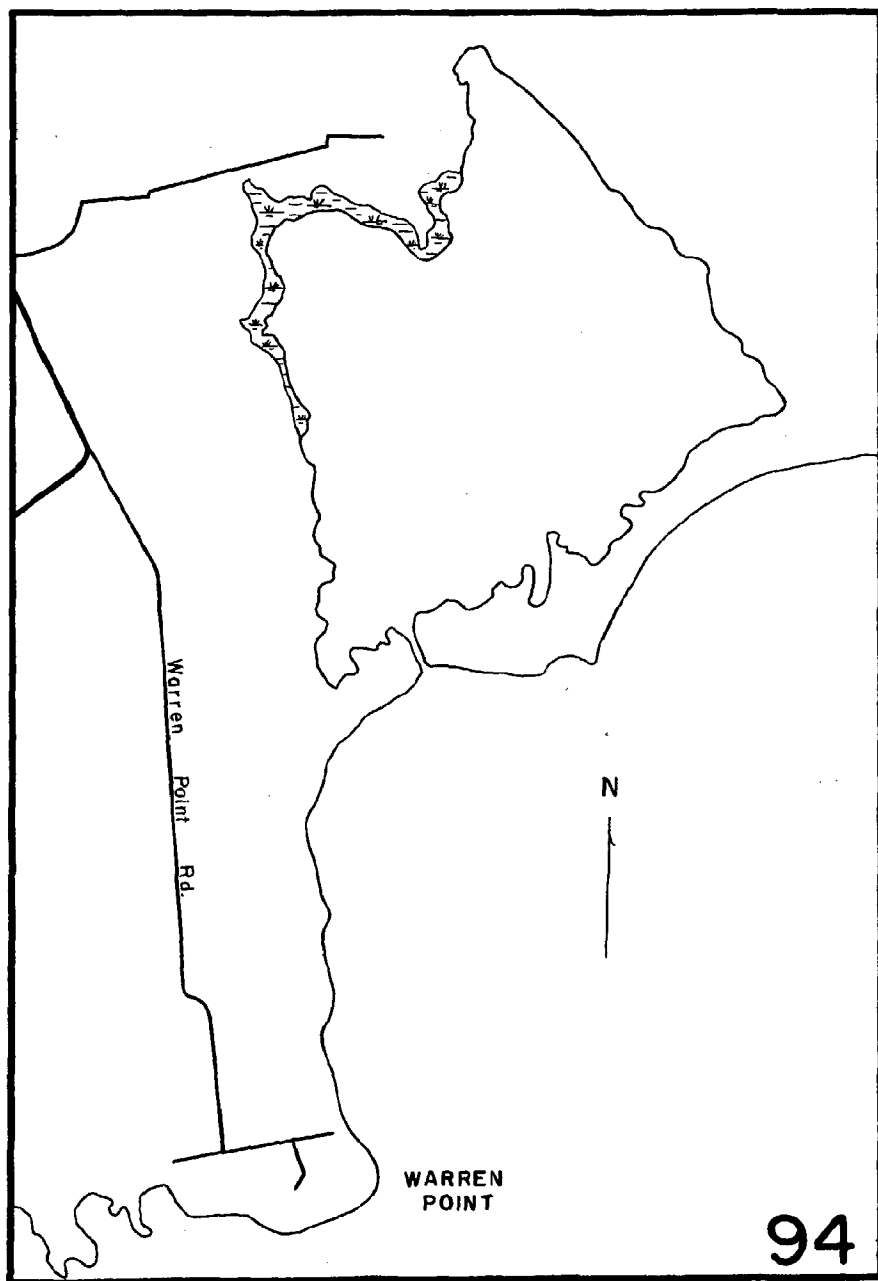
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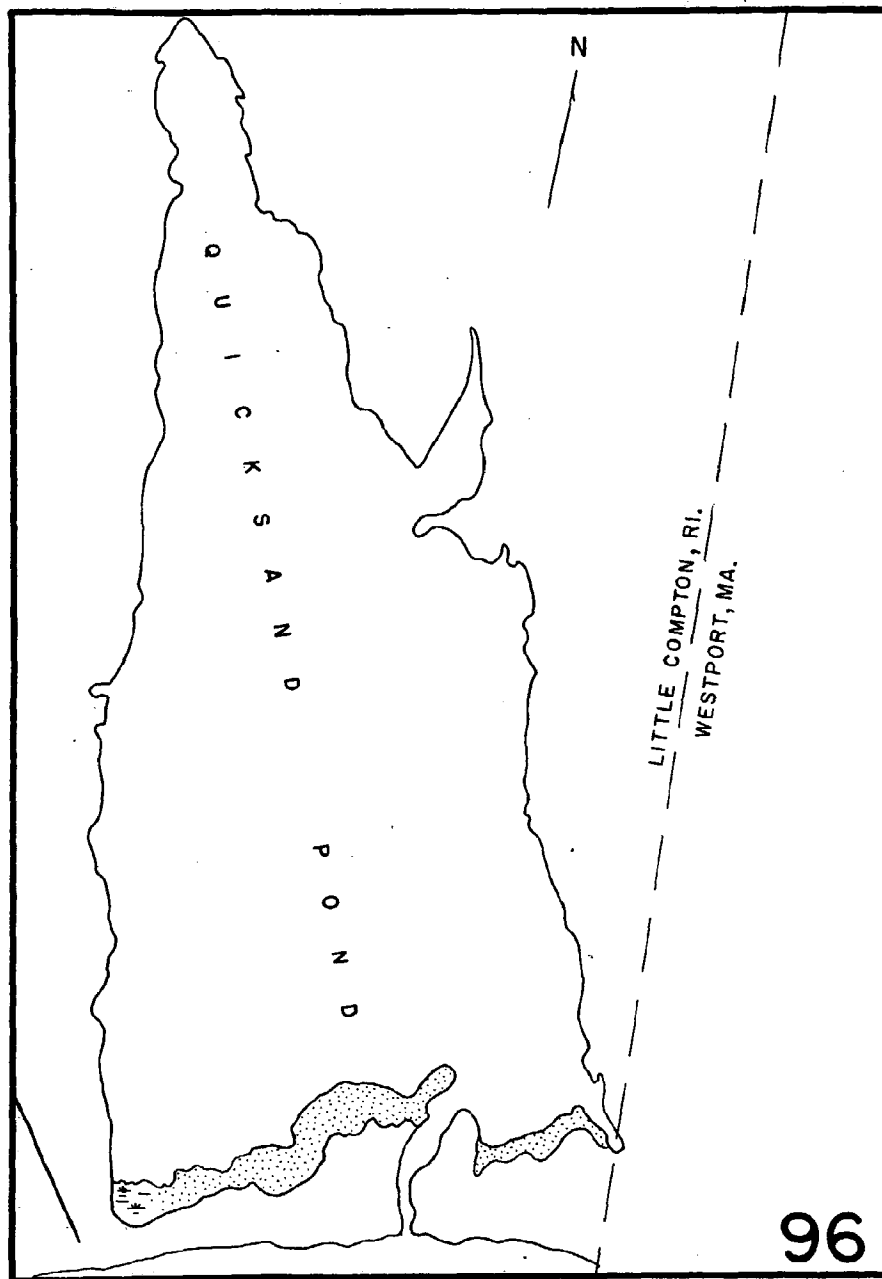
HIGH HILL  
POINT

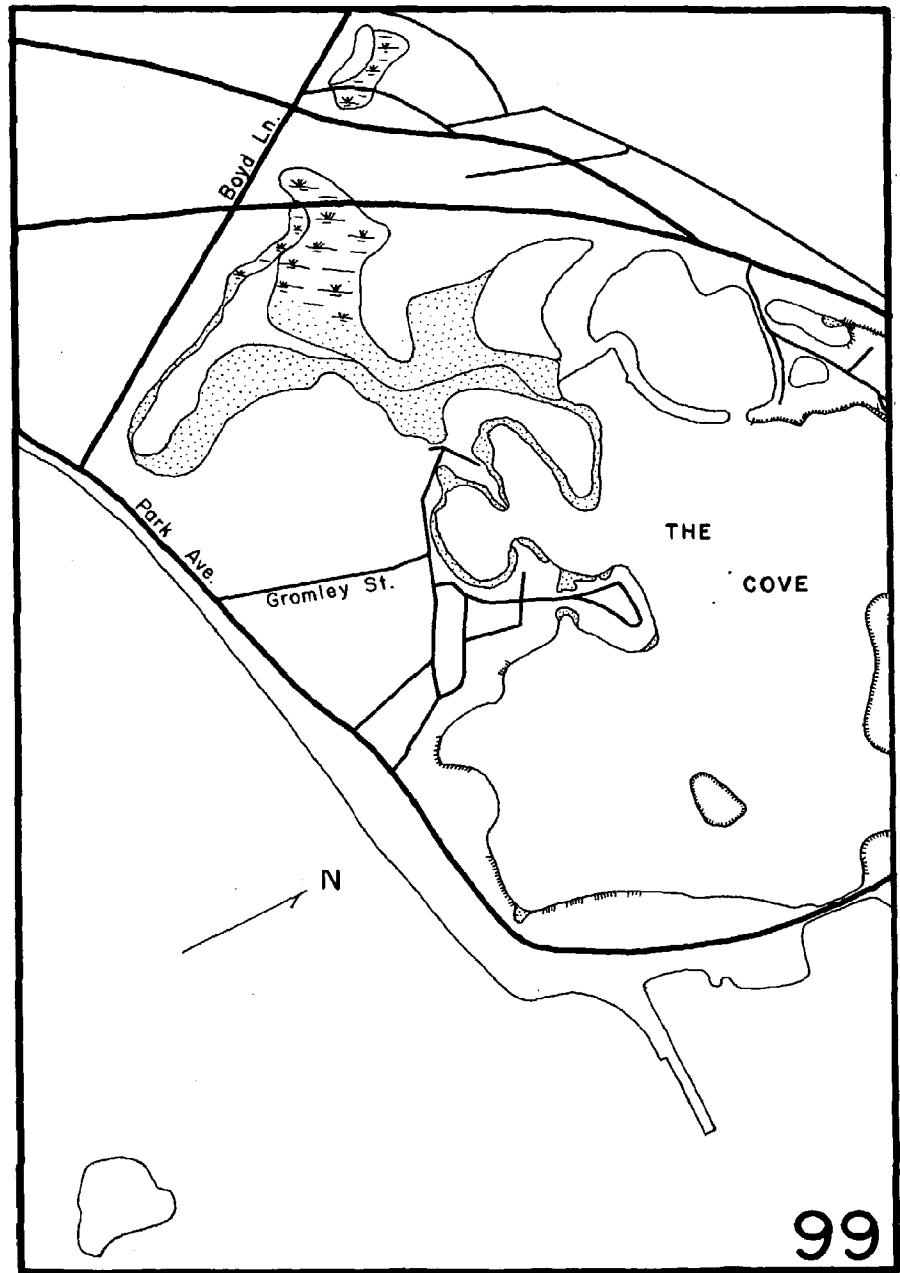
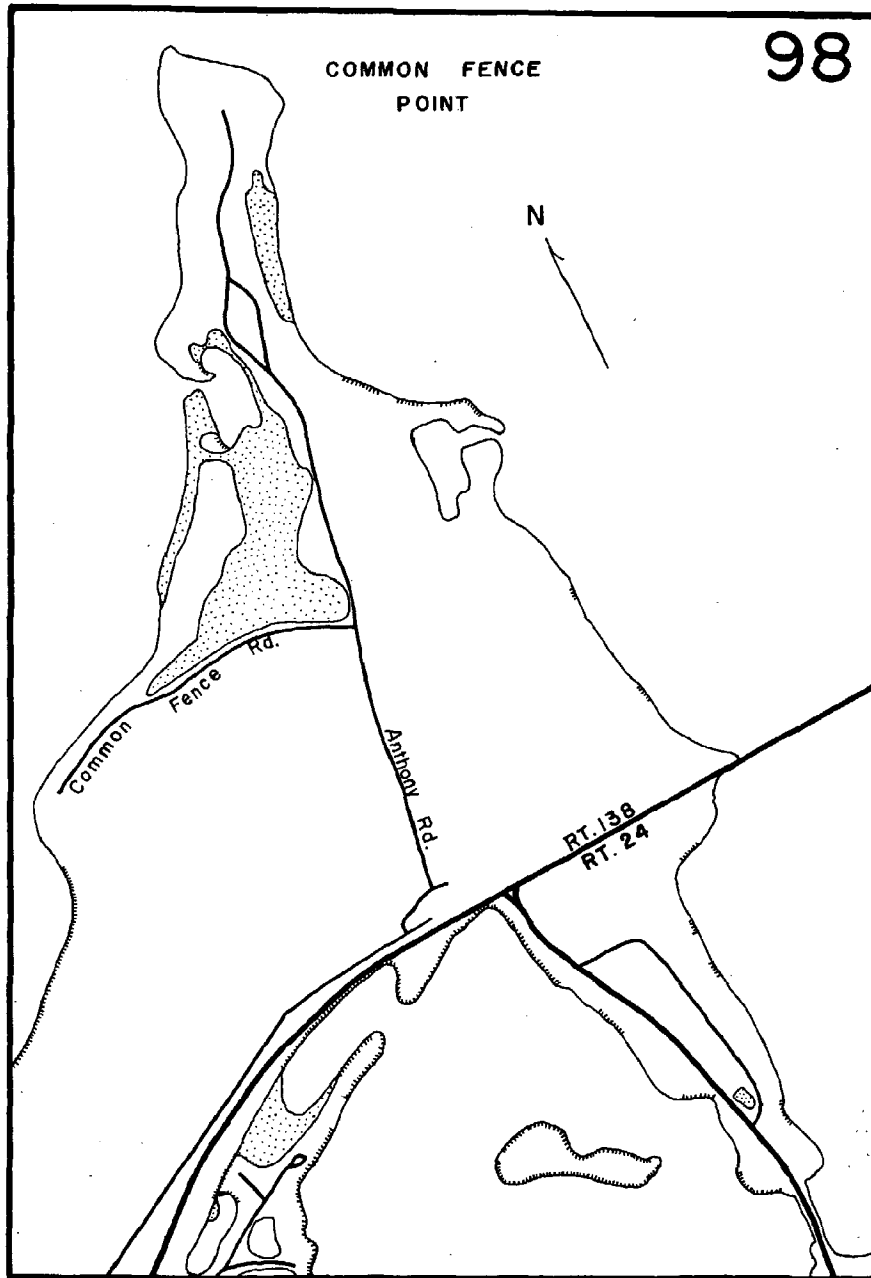
89

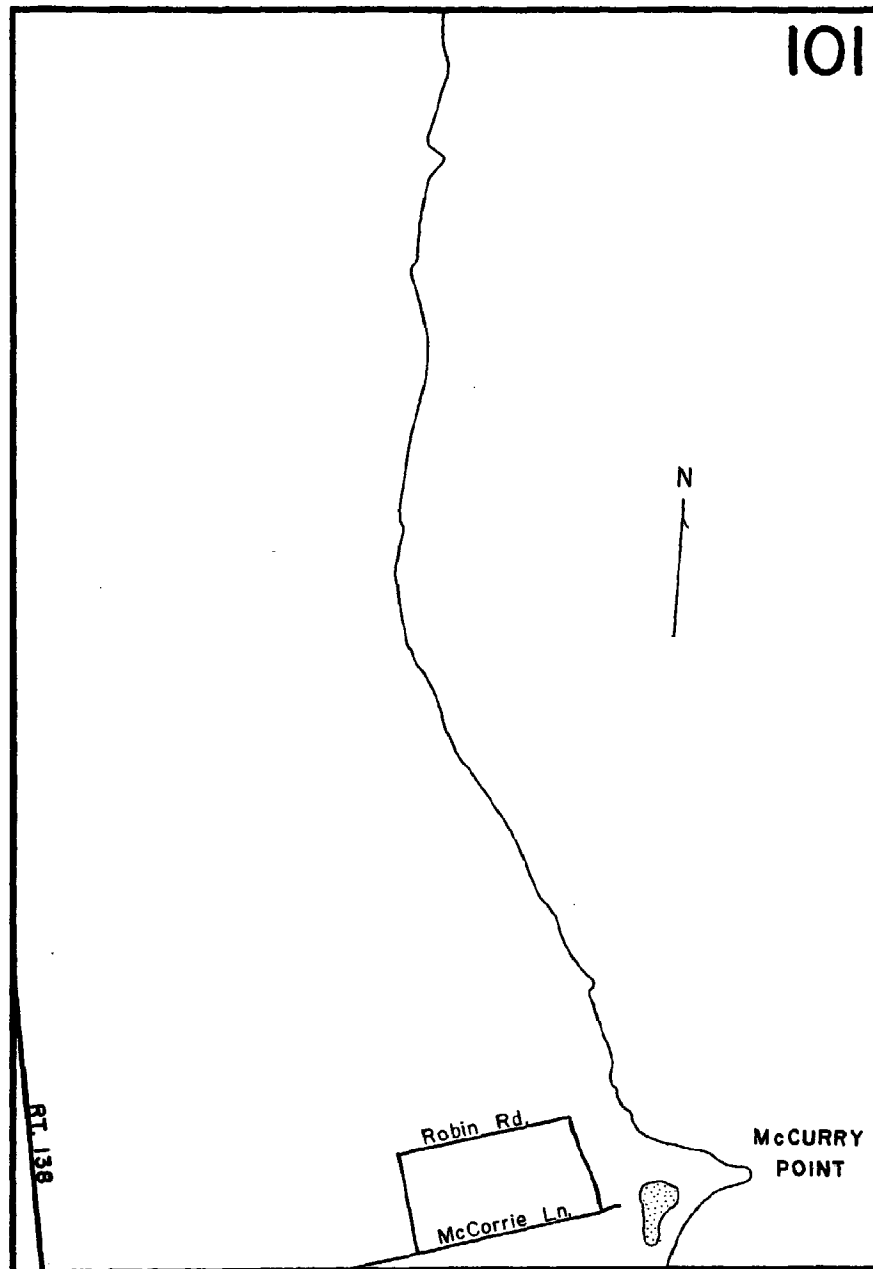
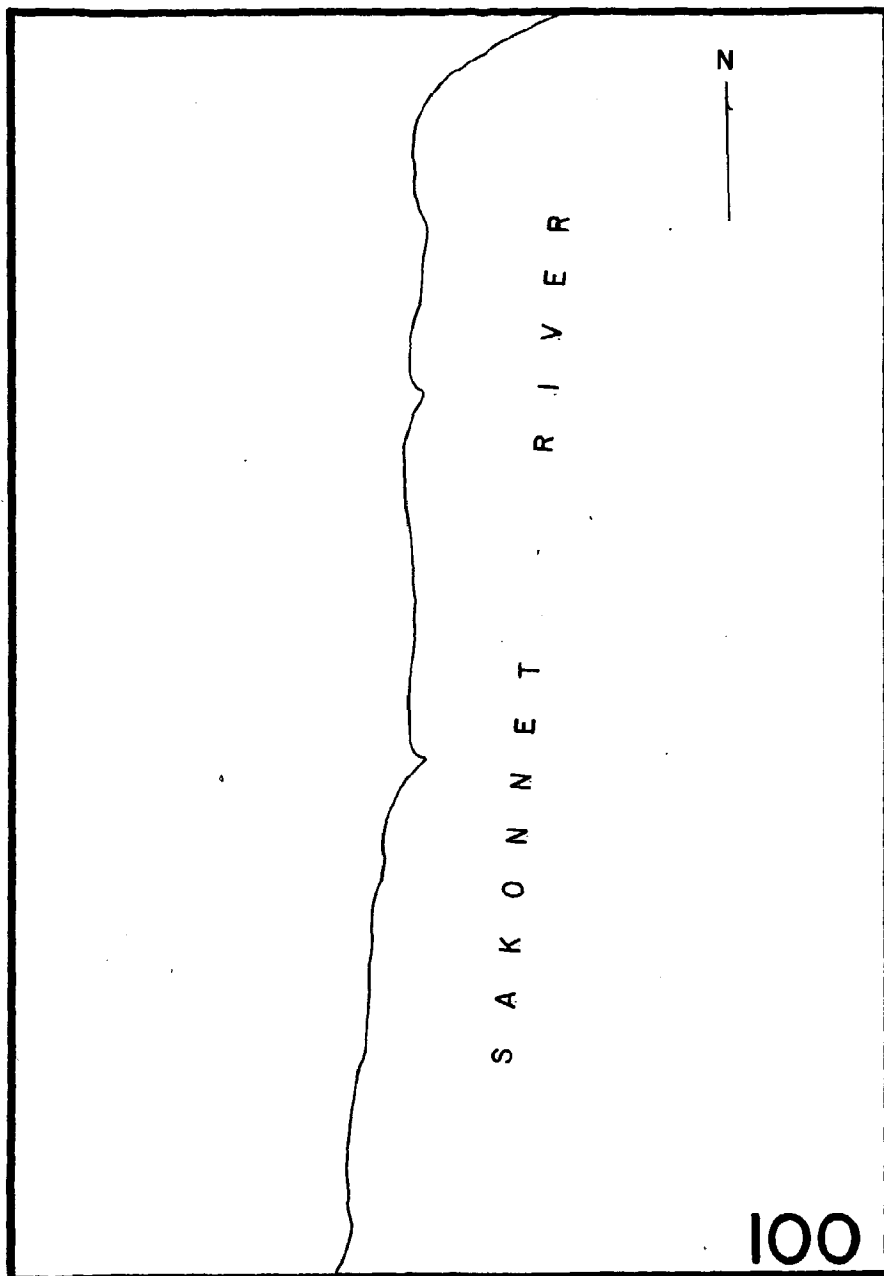












102

N

Sandy Point Rd

SANDY  
POINT

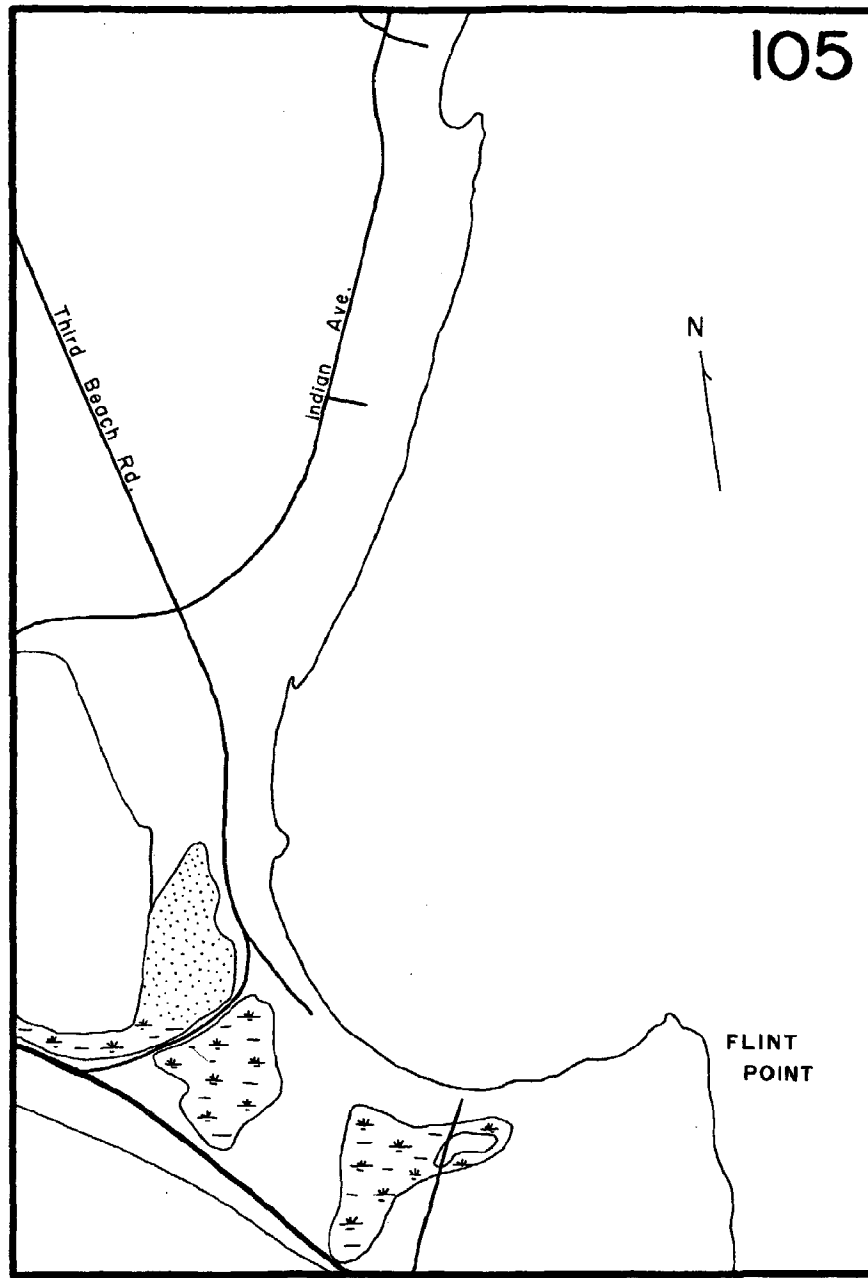
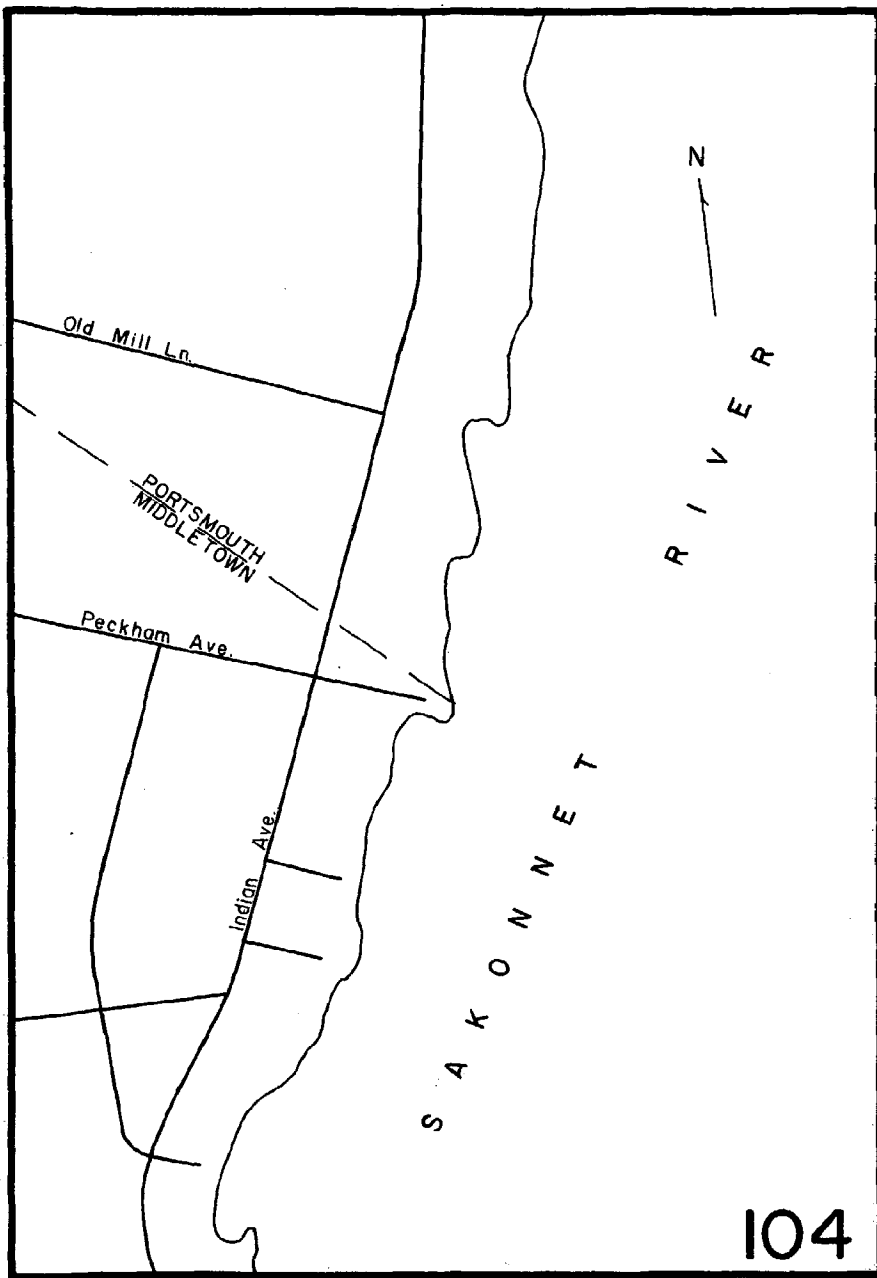


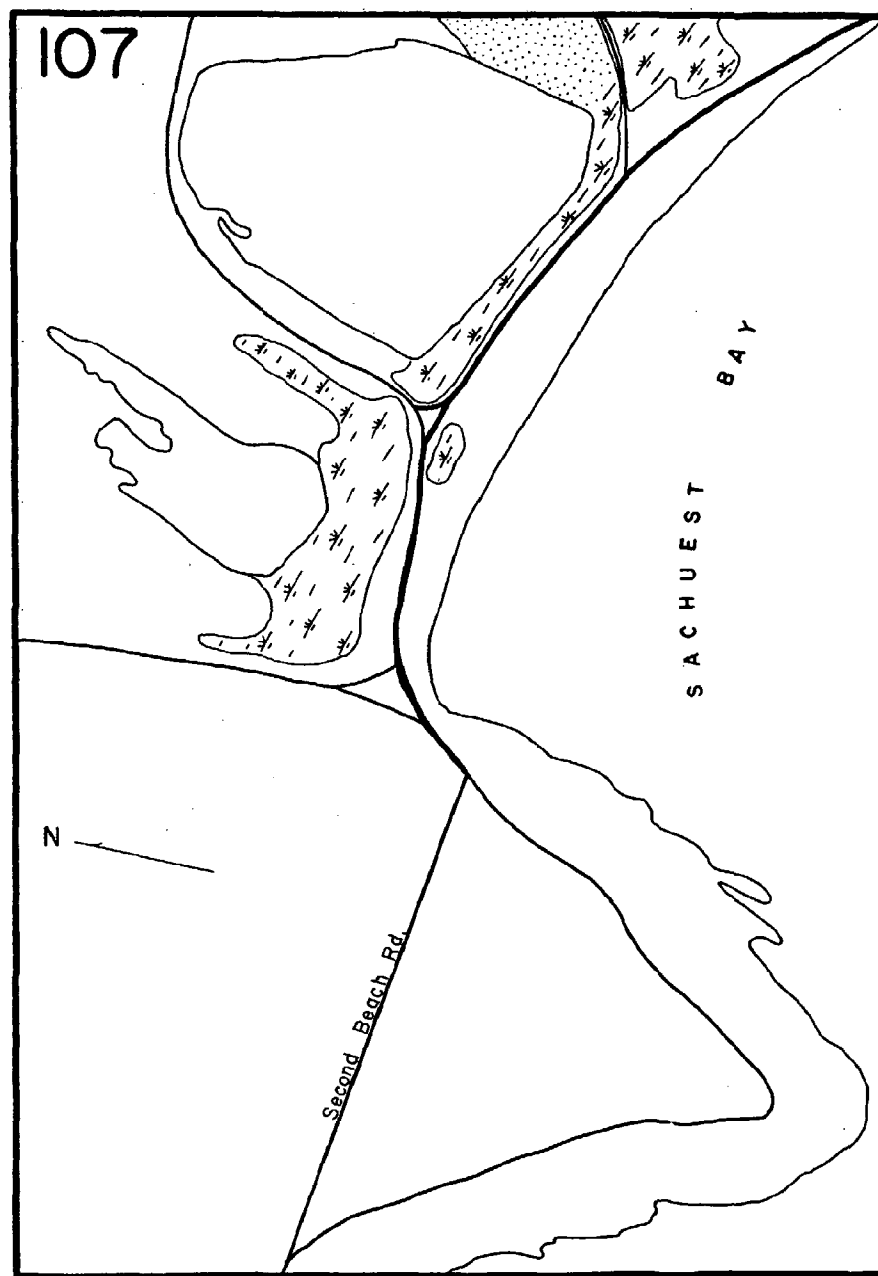
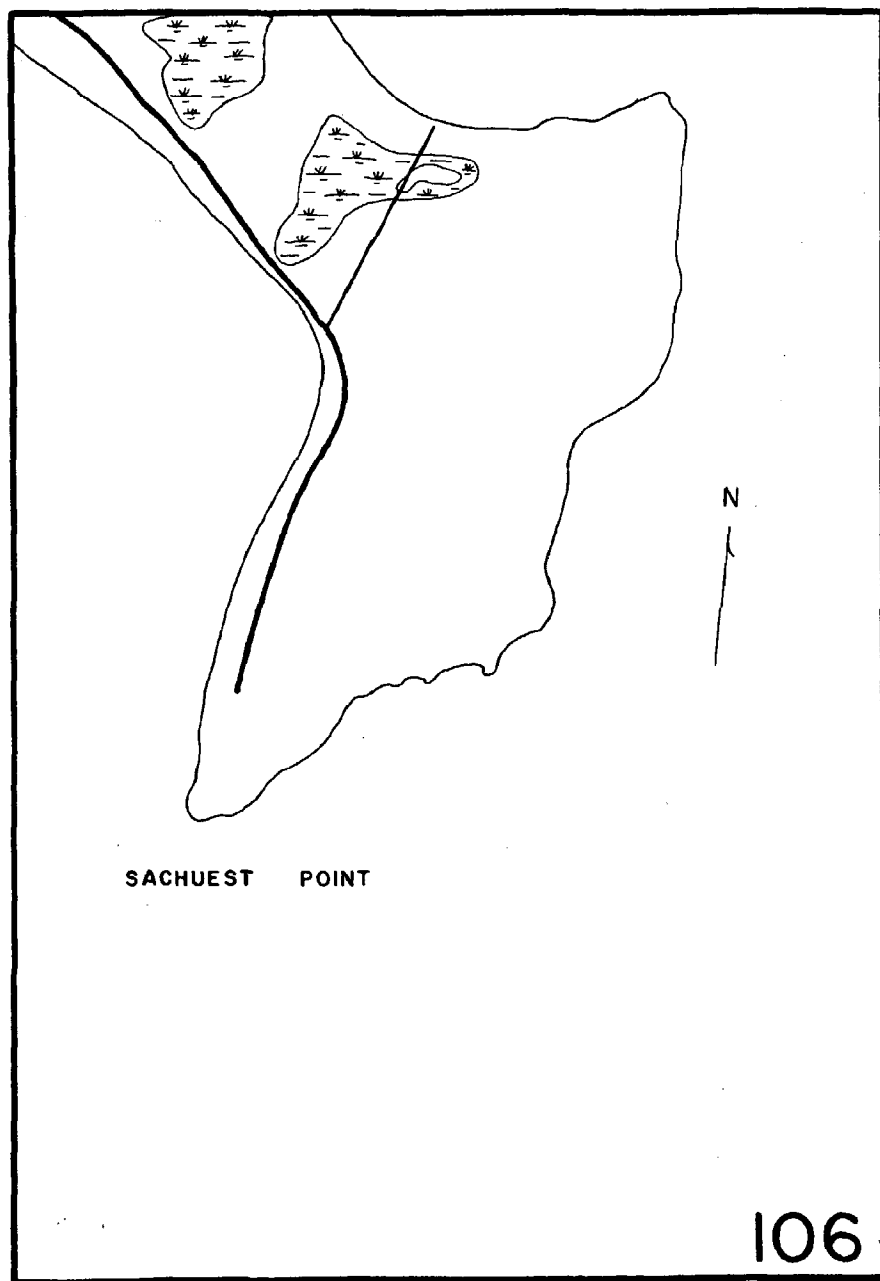
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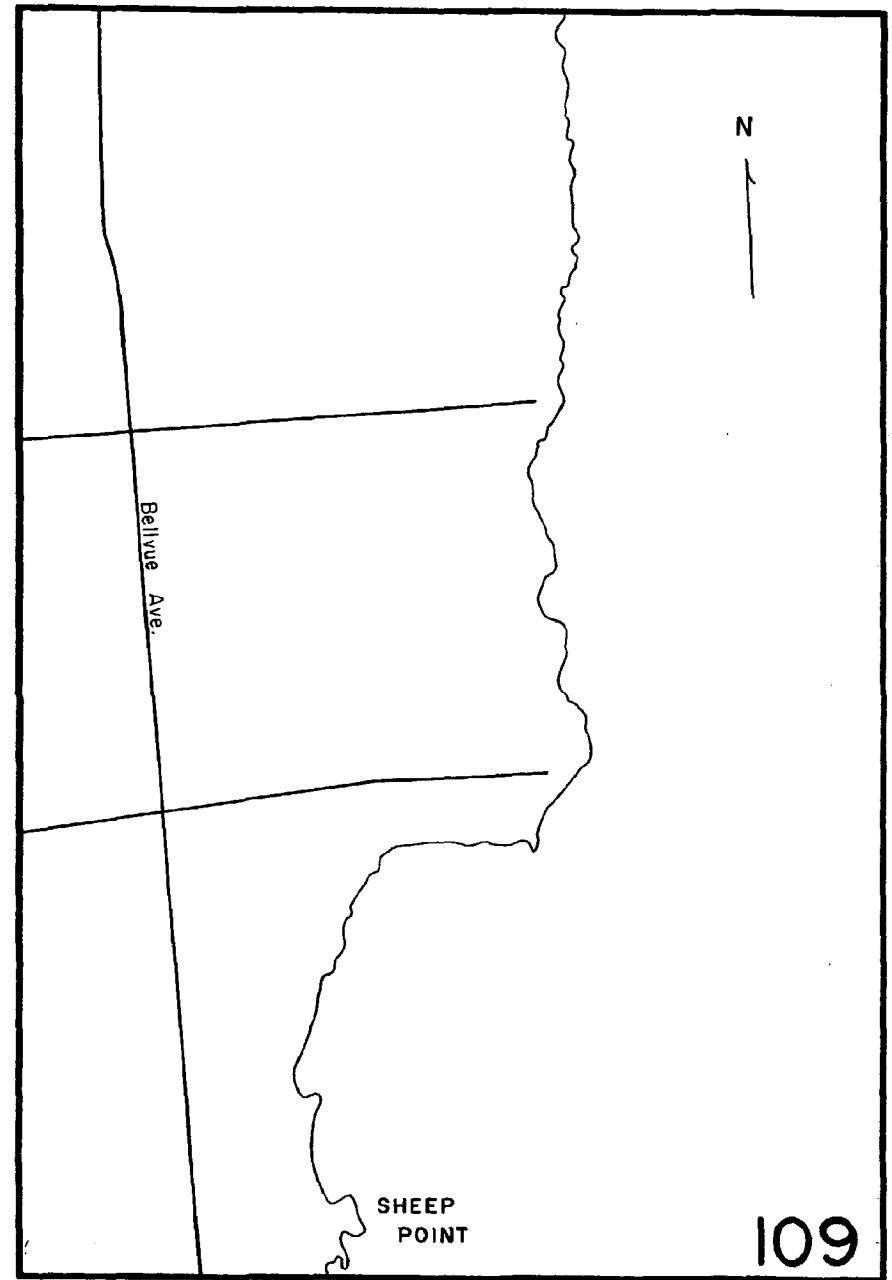
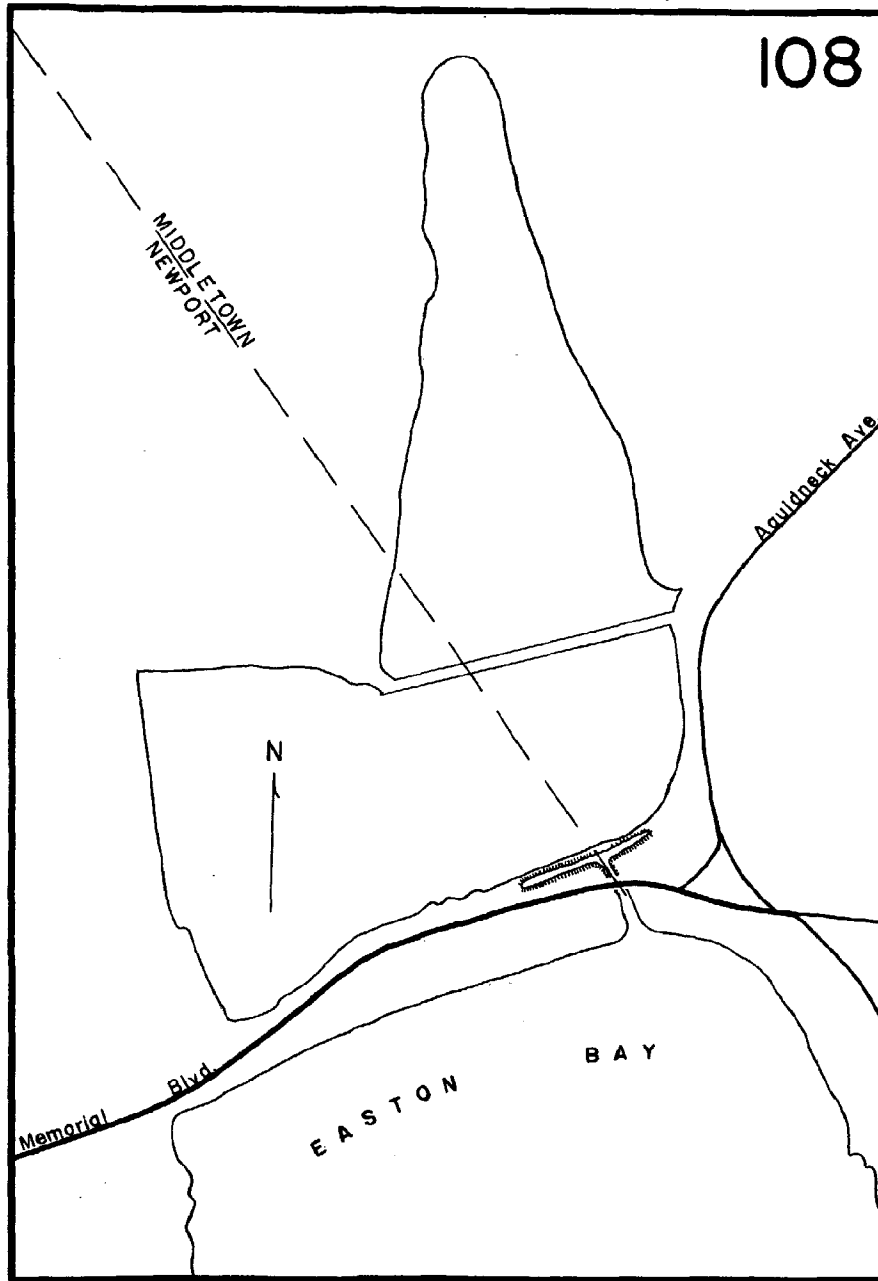
BLACK  
POINT

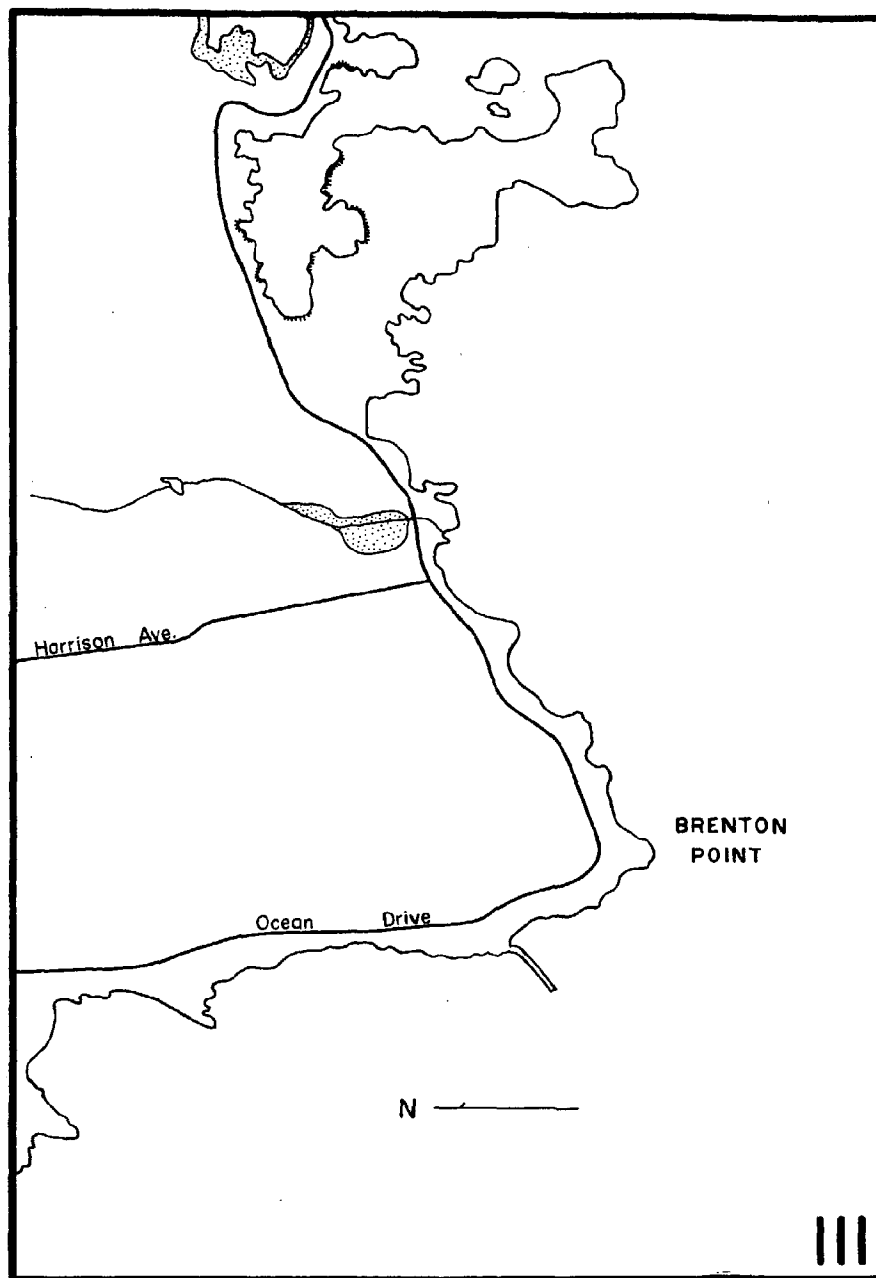
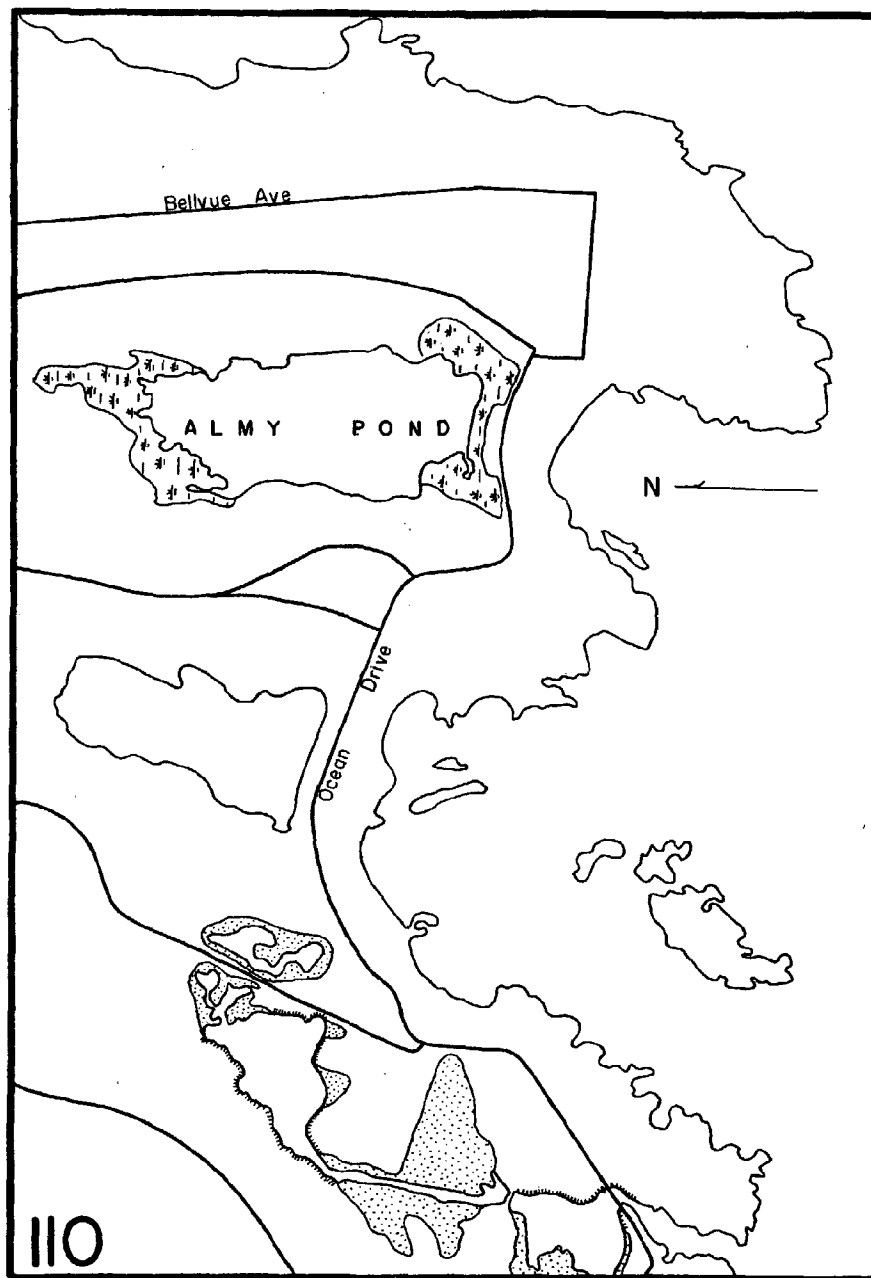
103

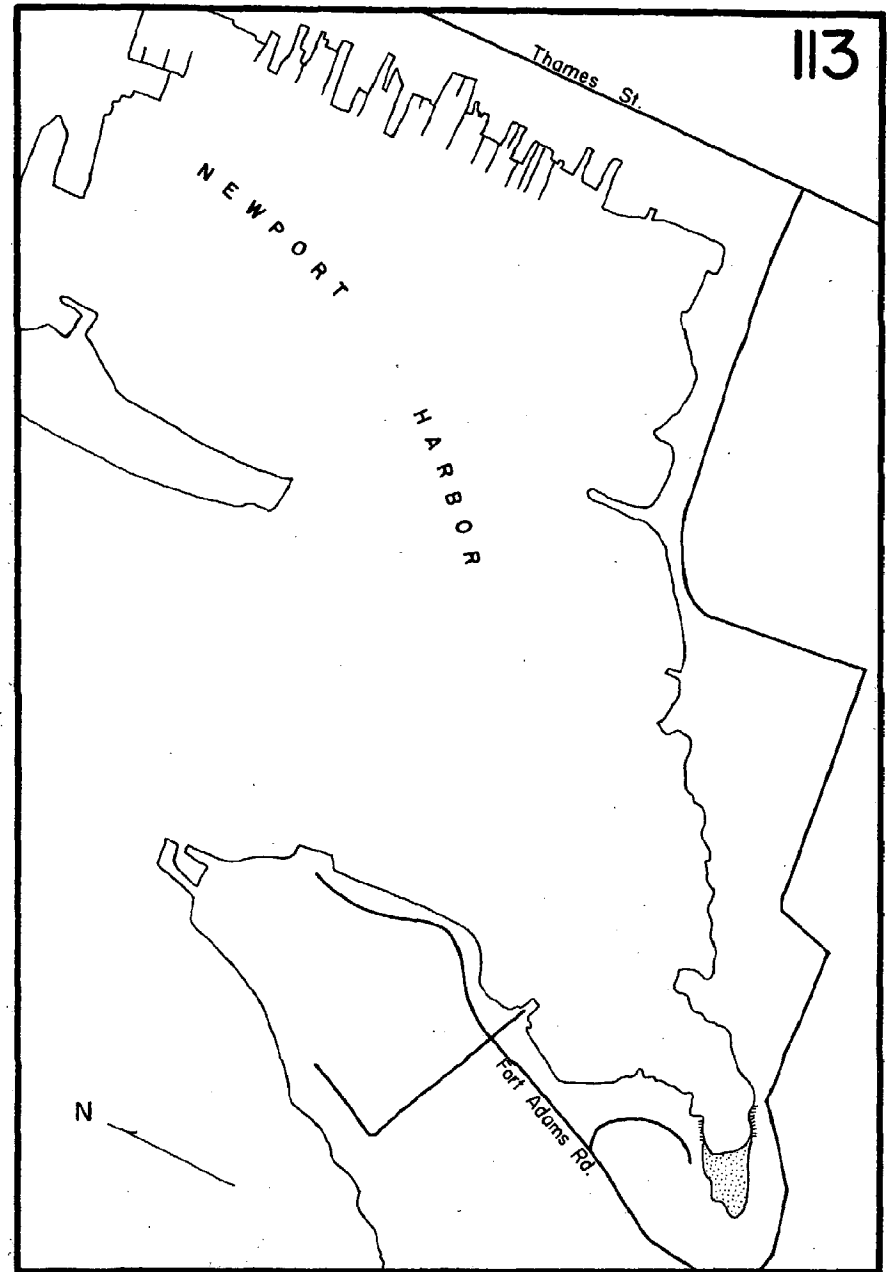
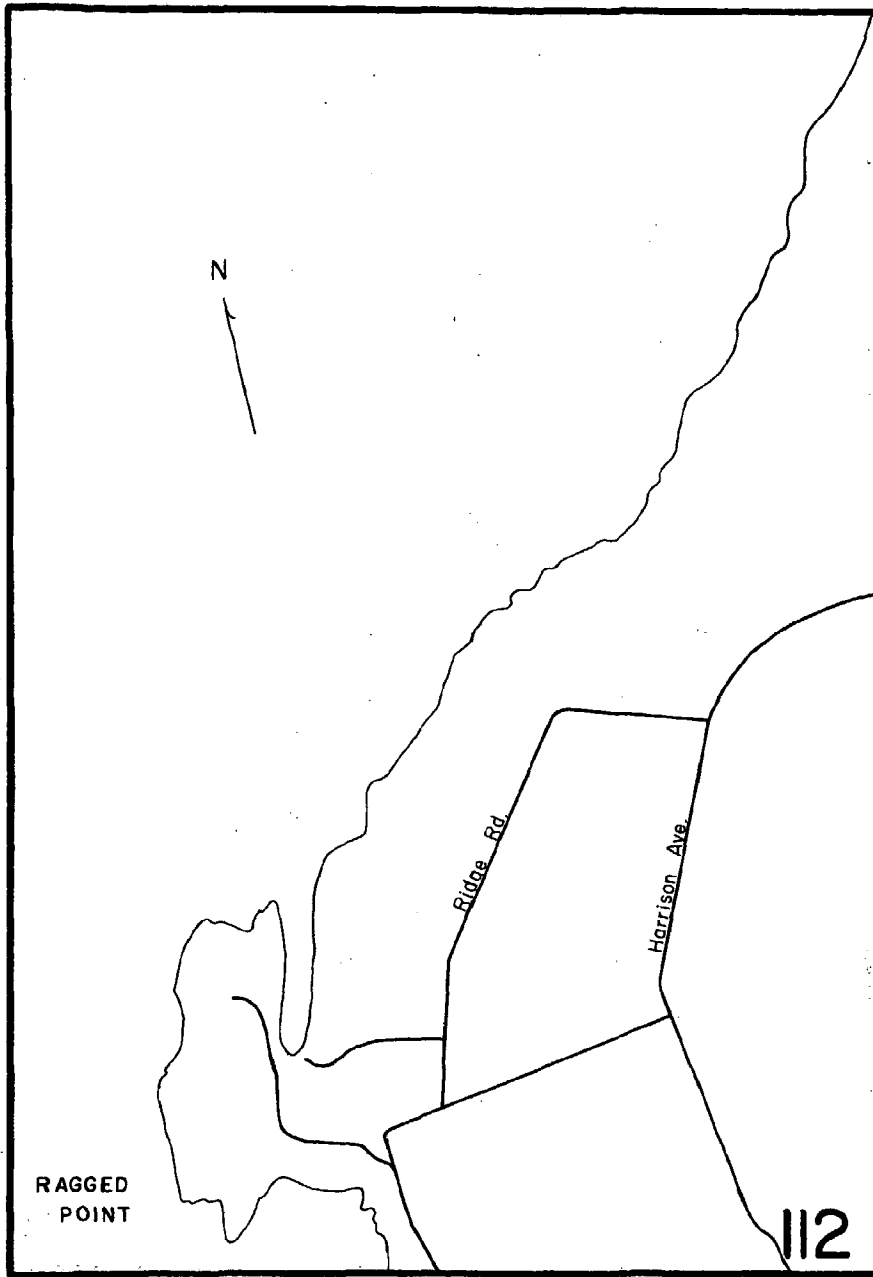


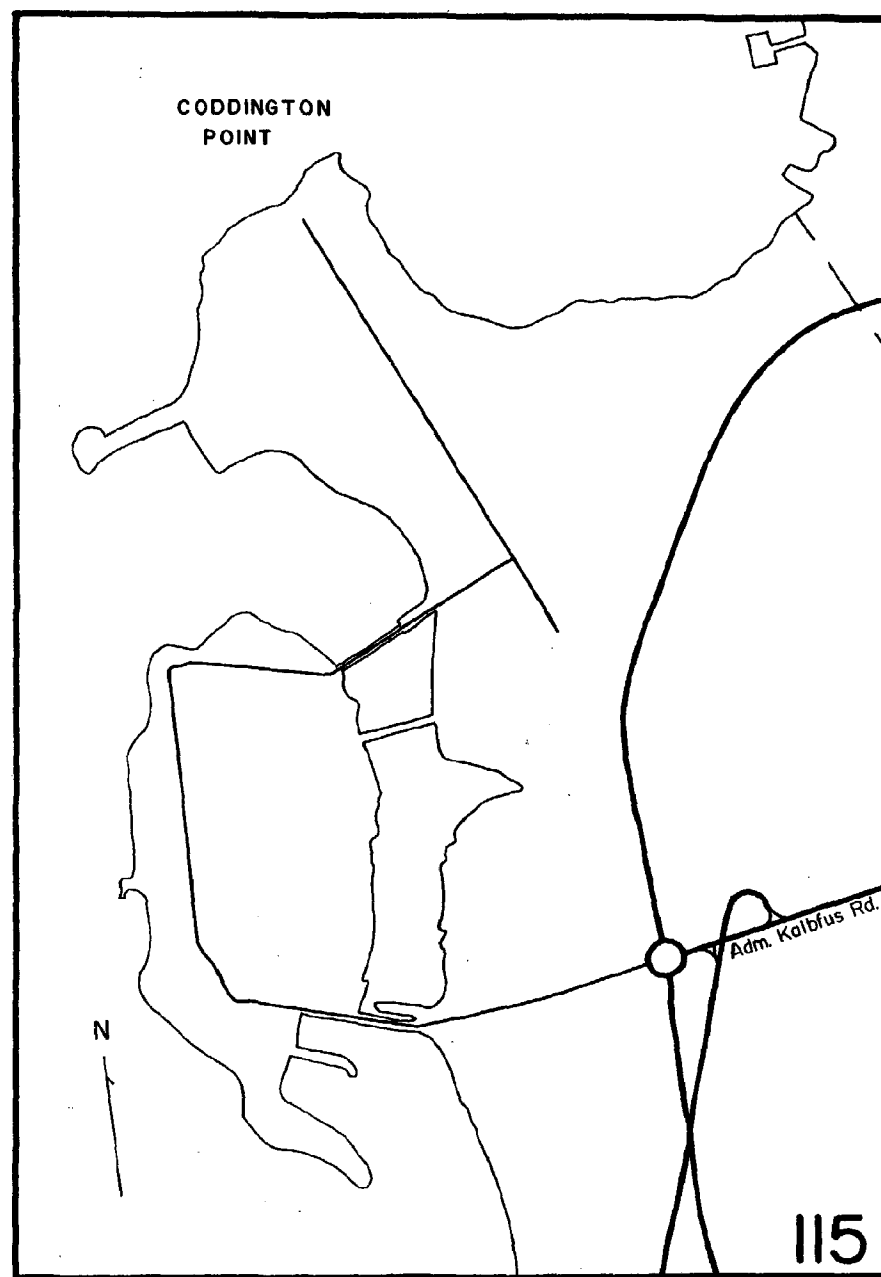
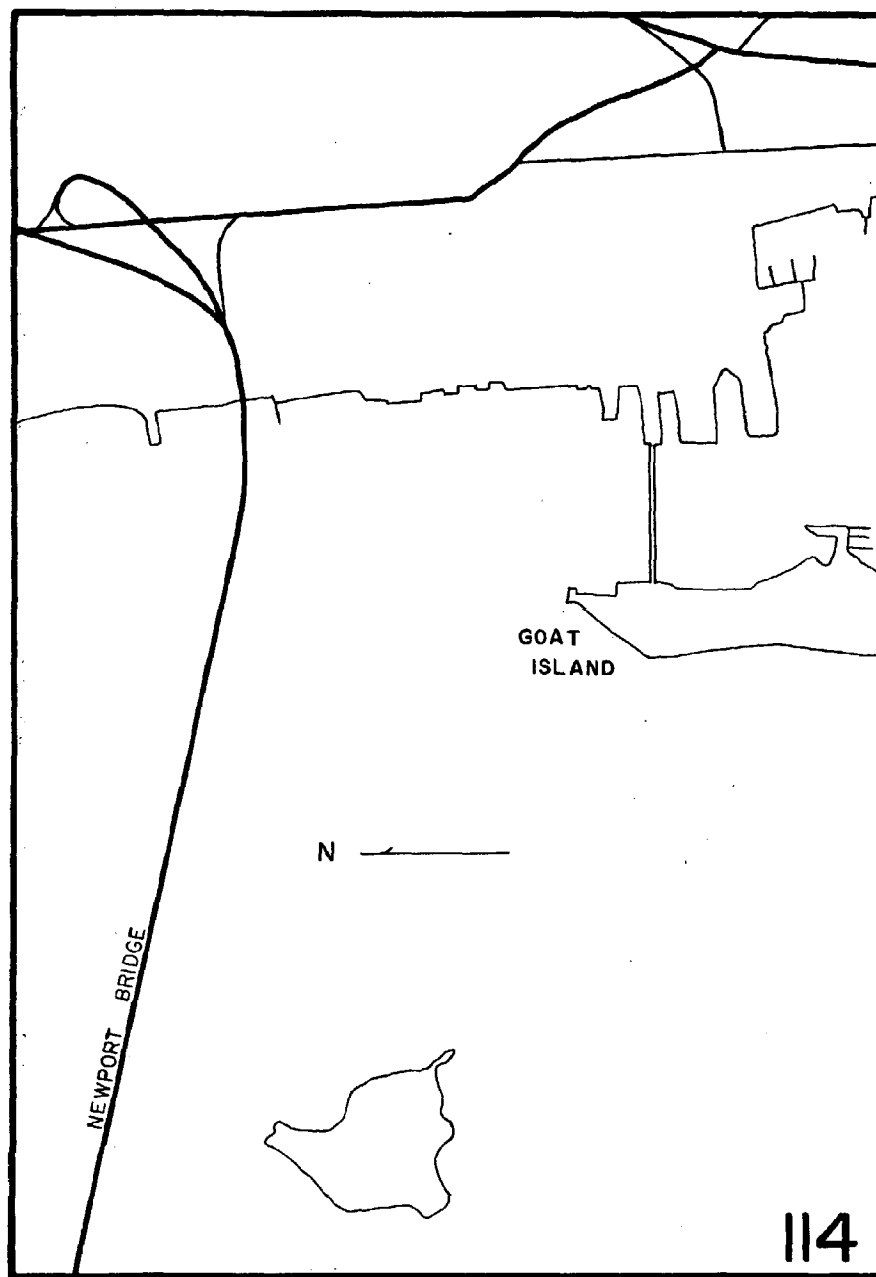


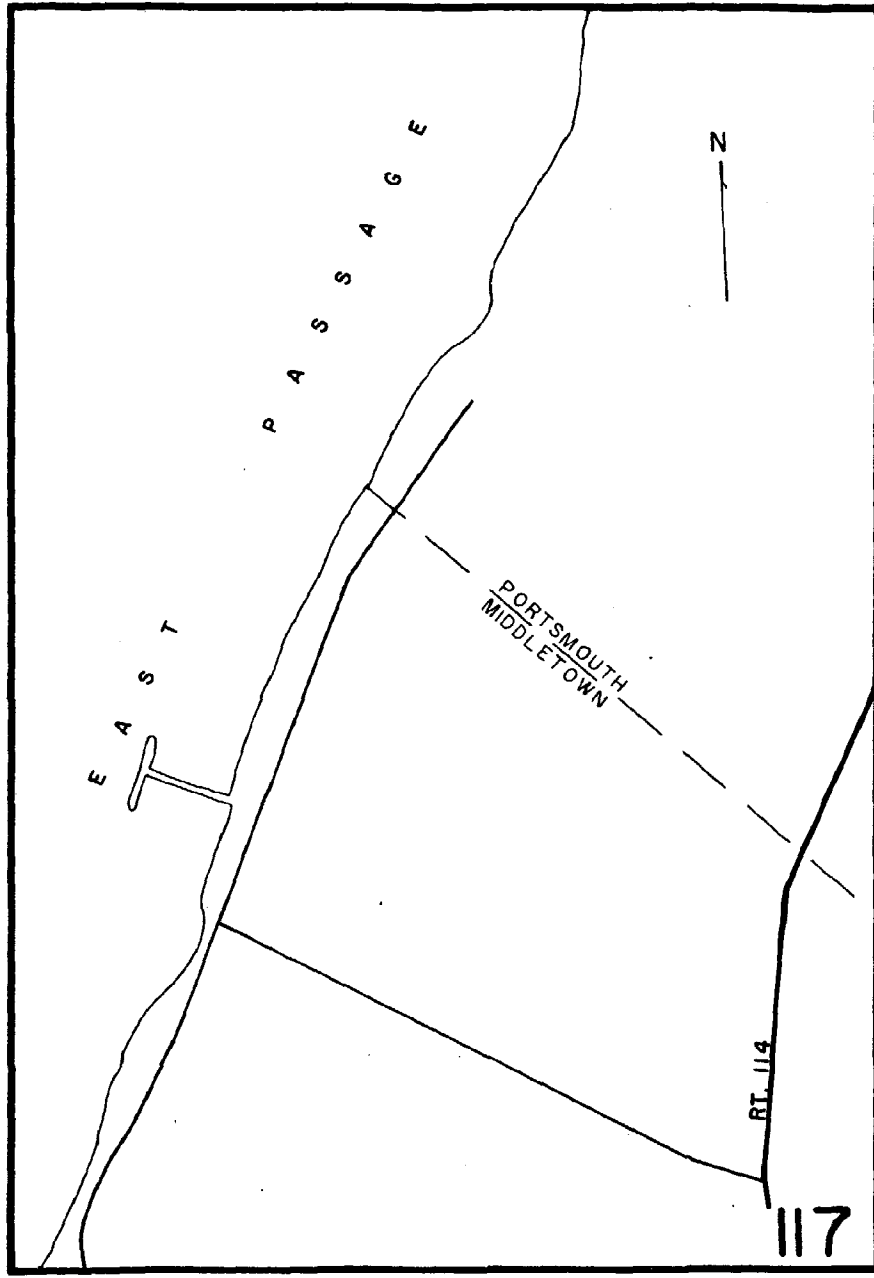
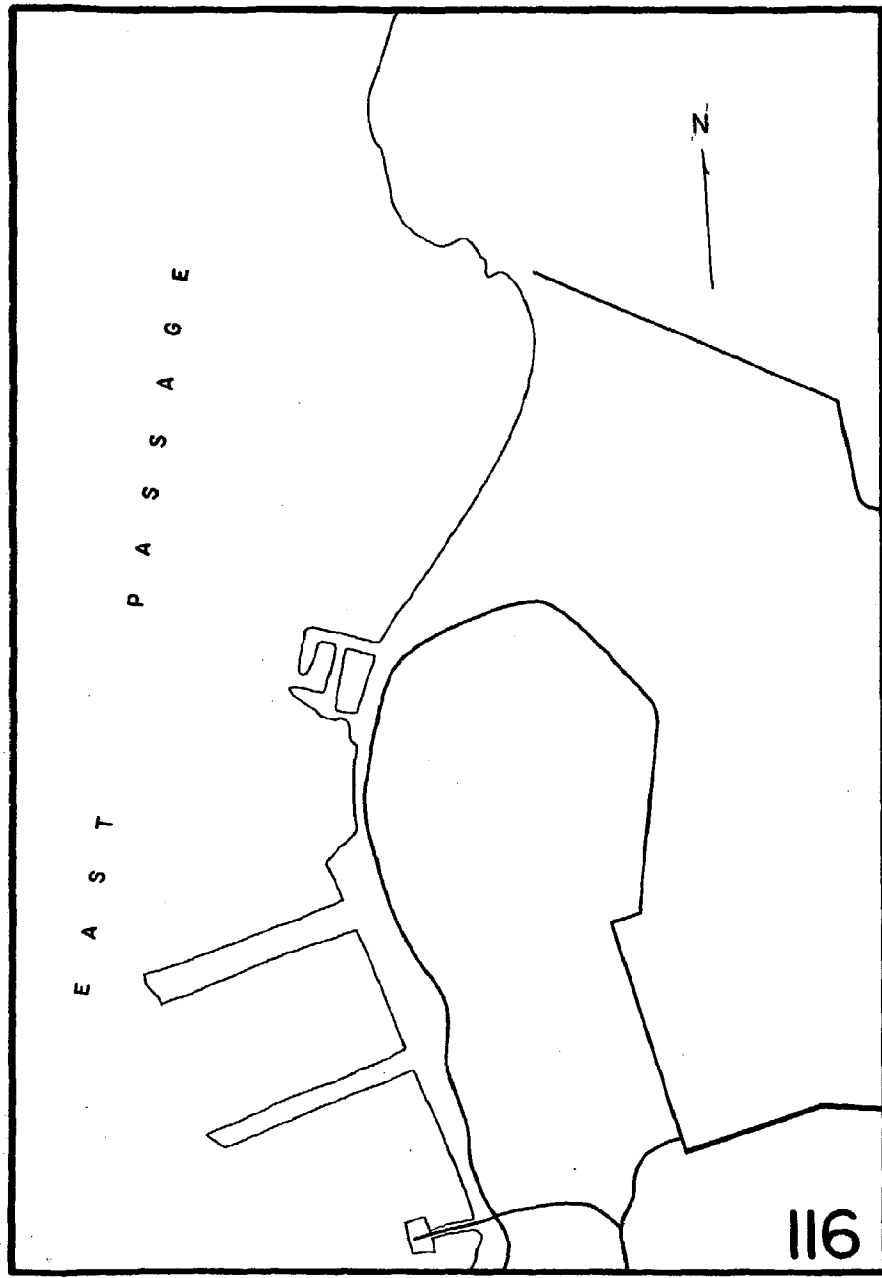


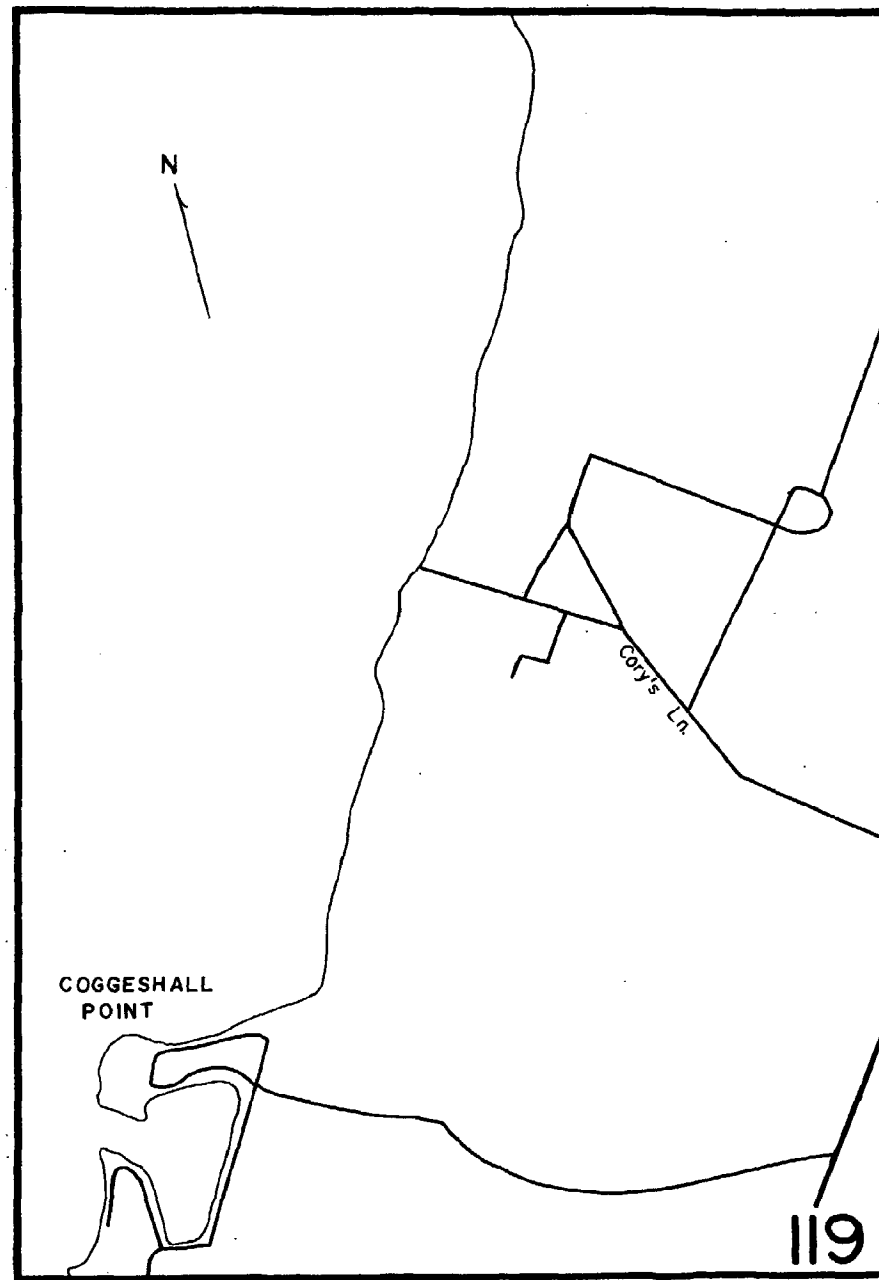
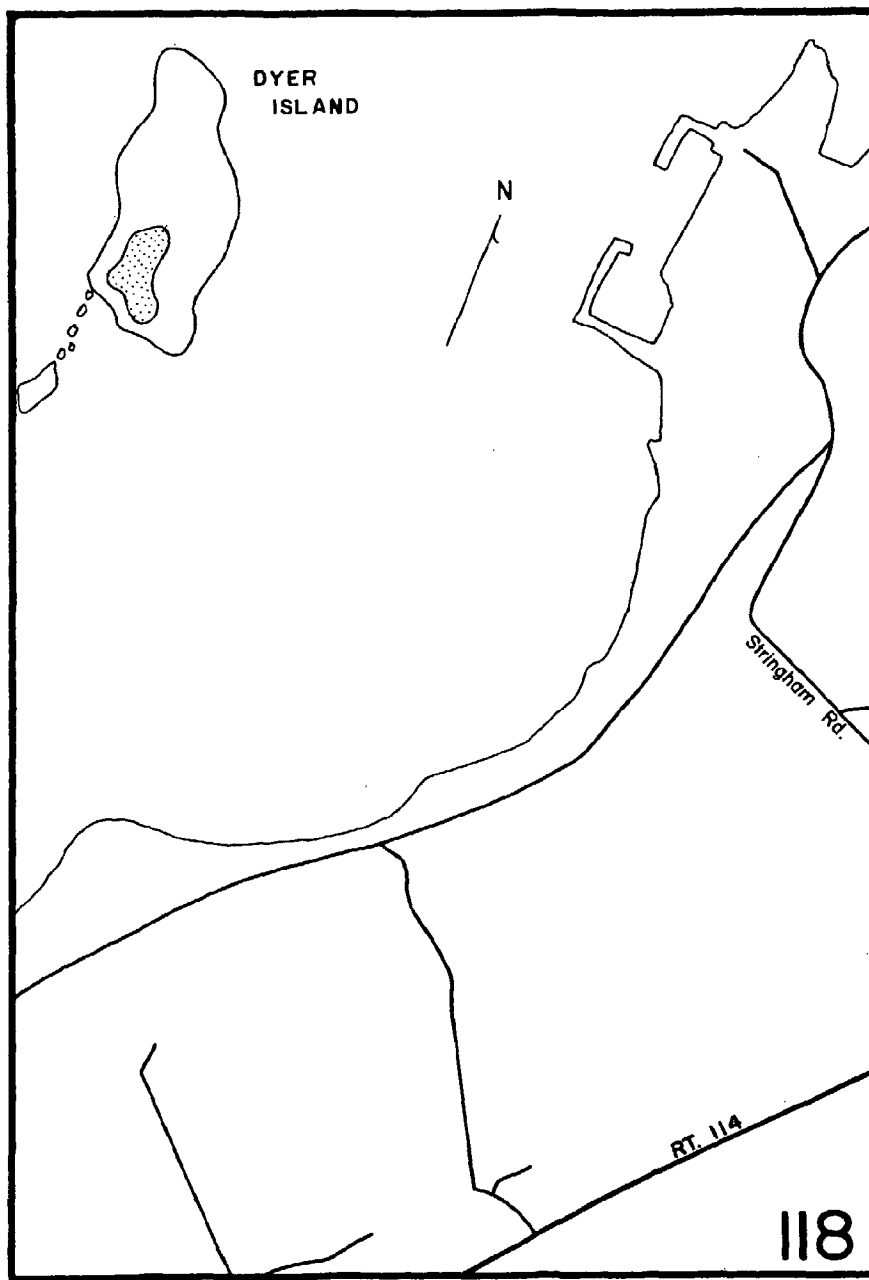




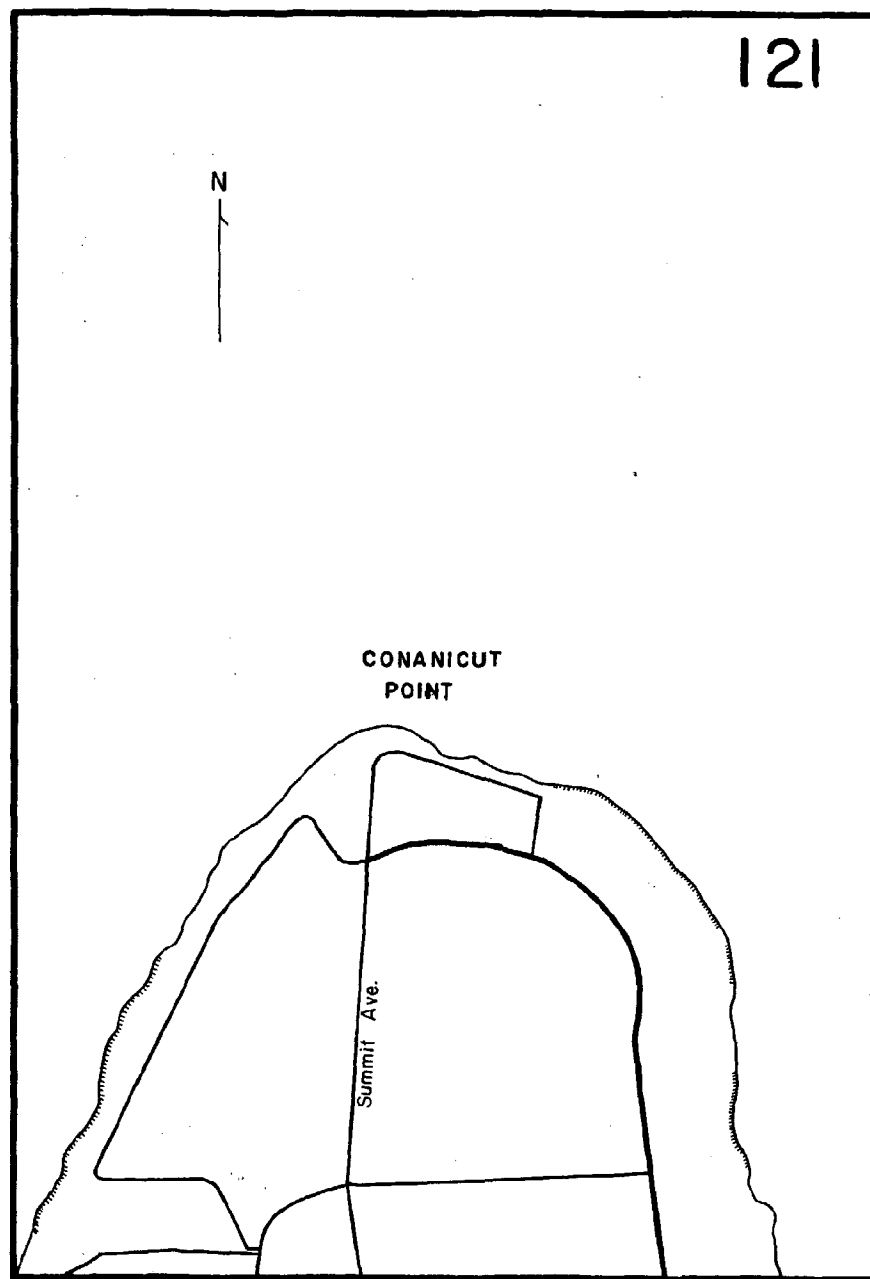
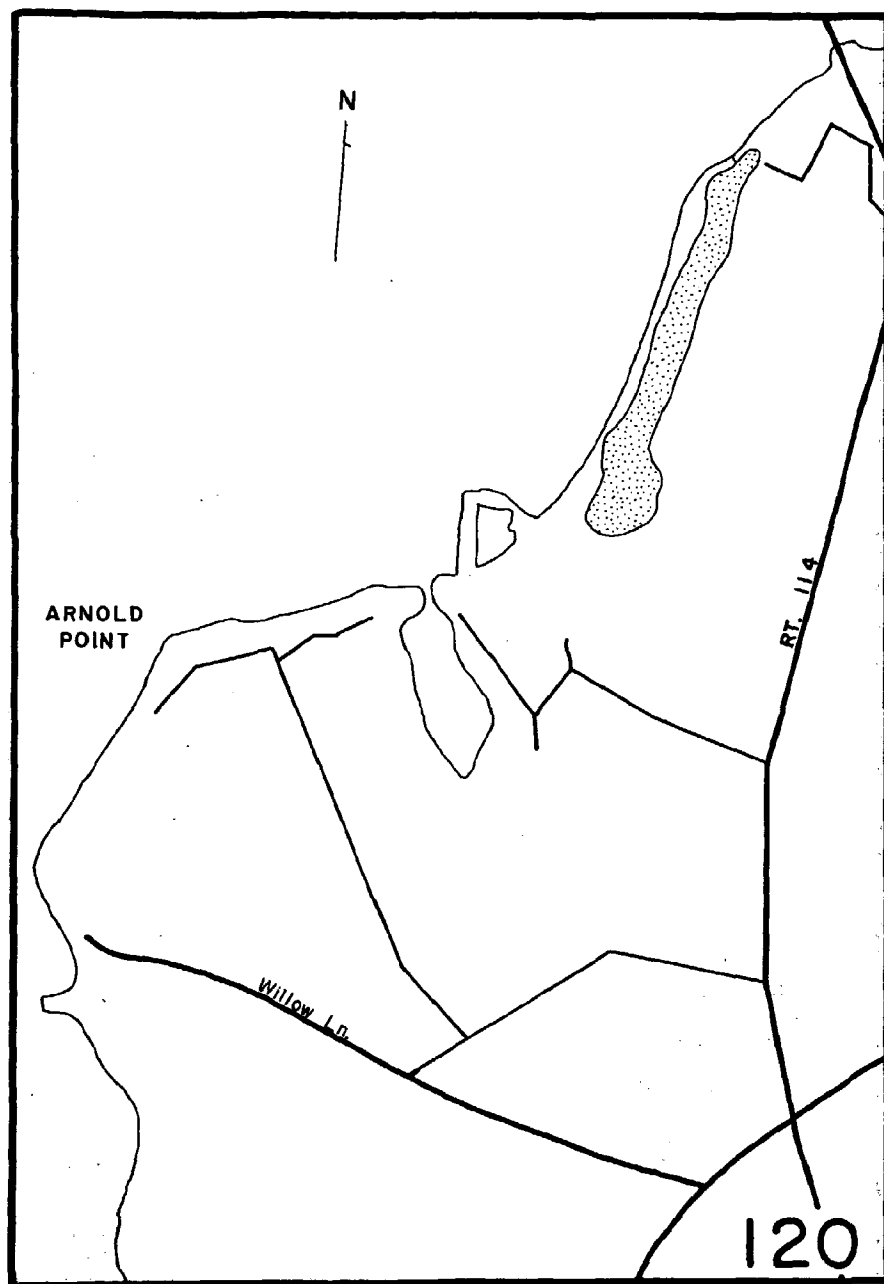


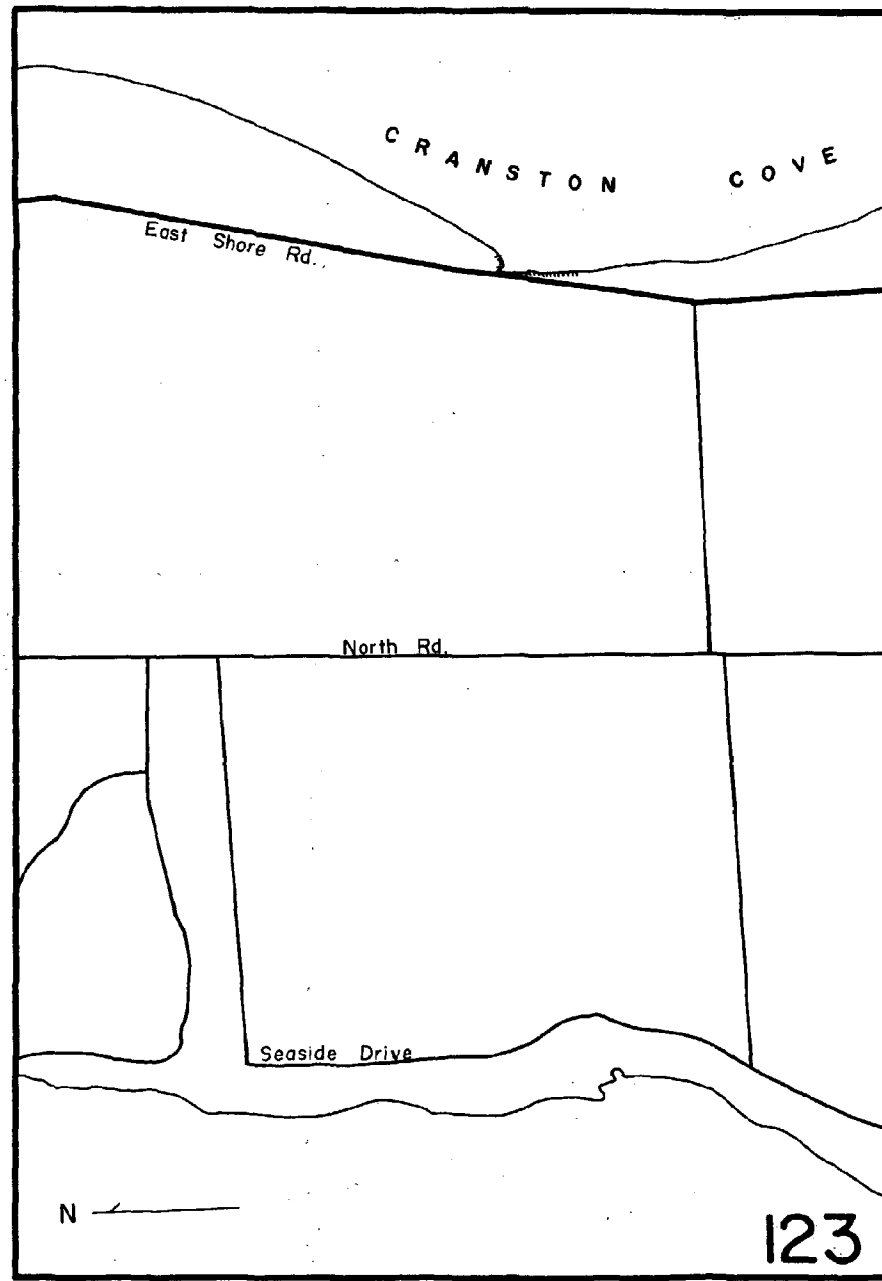
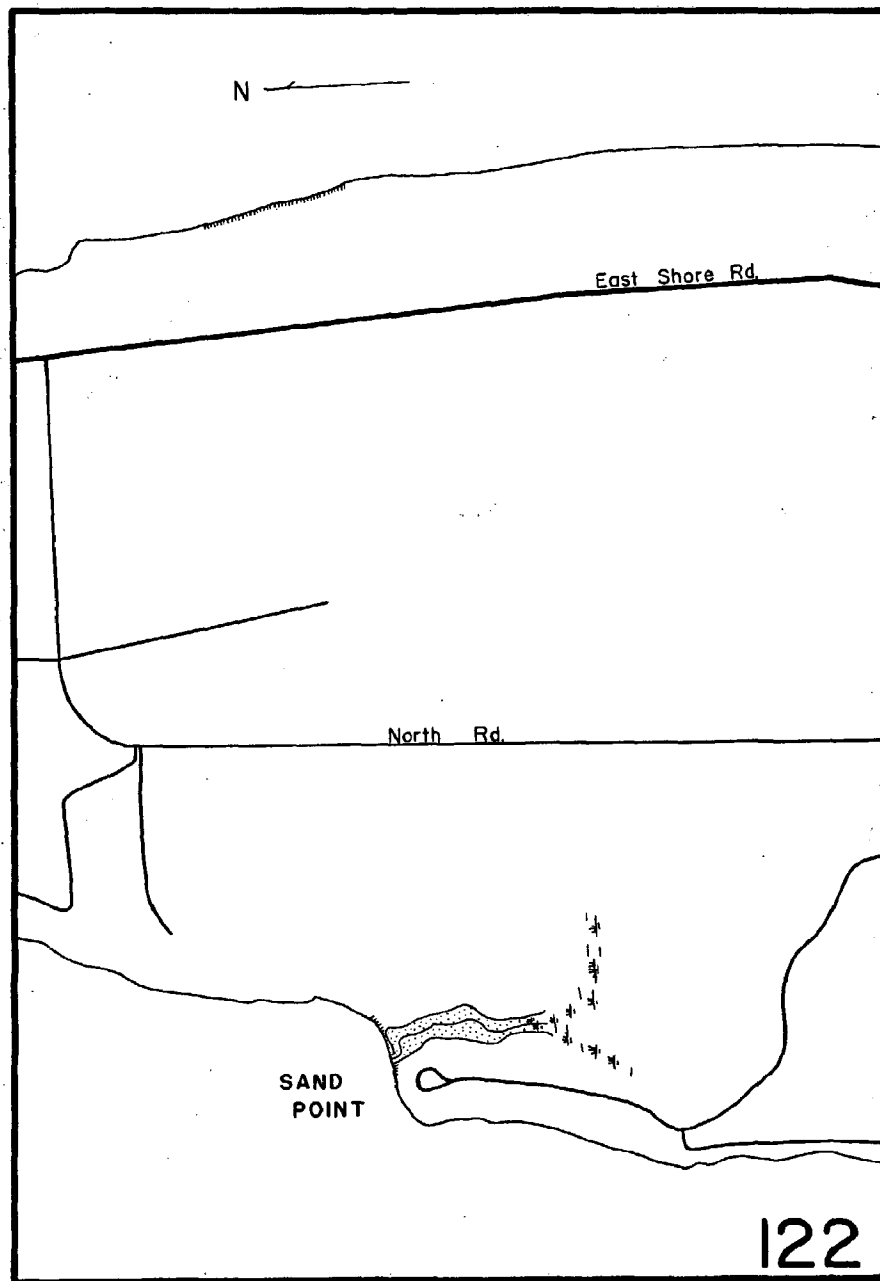


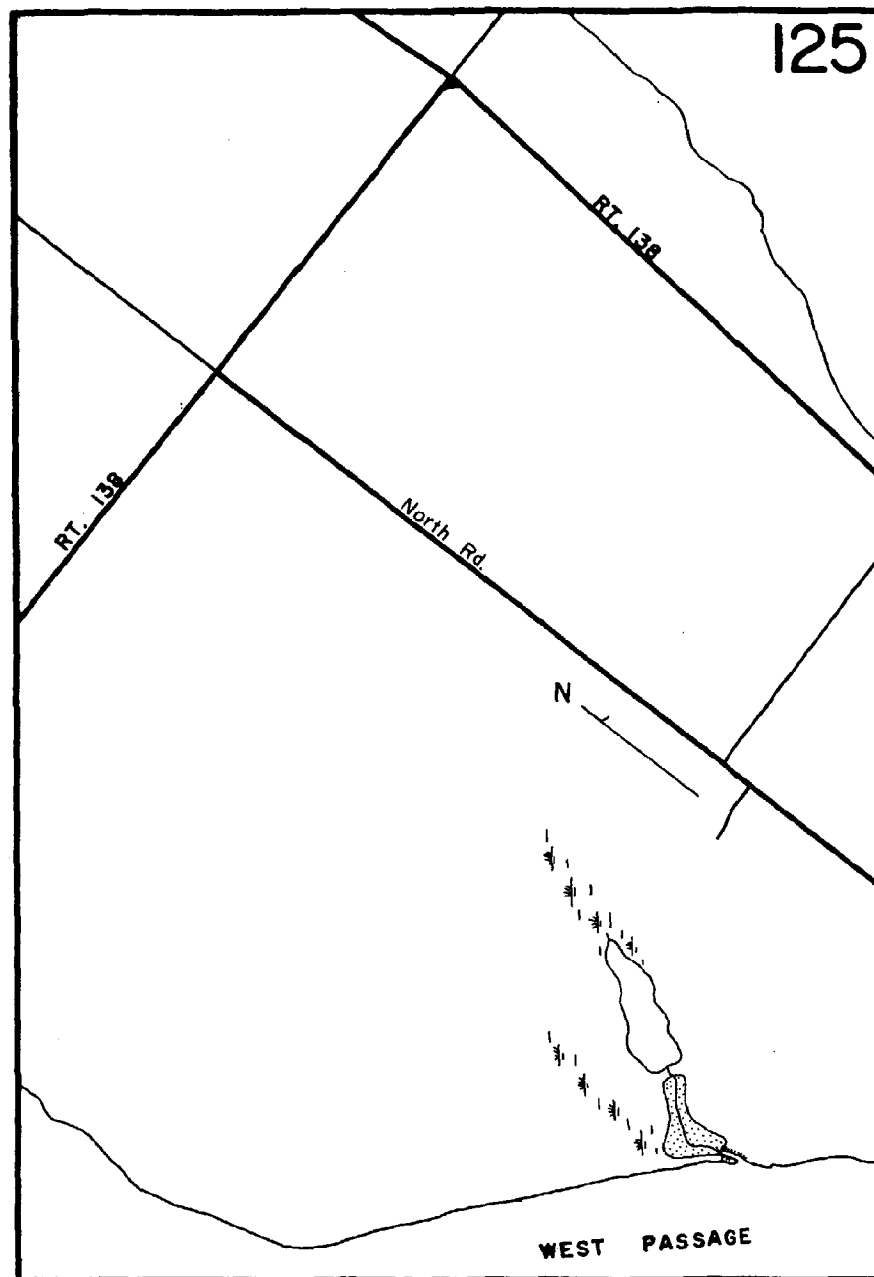
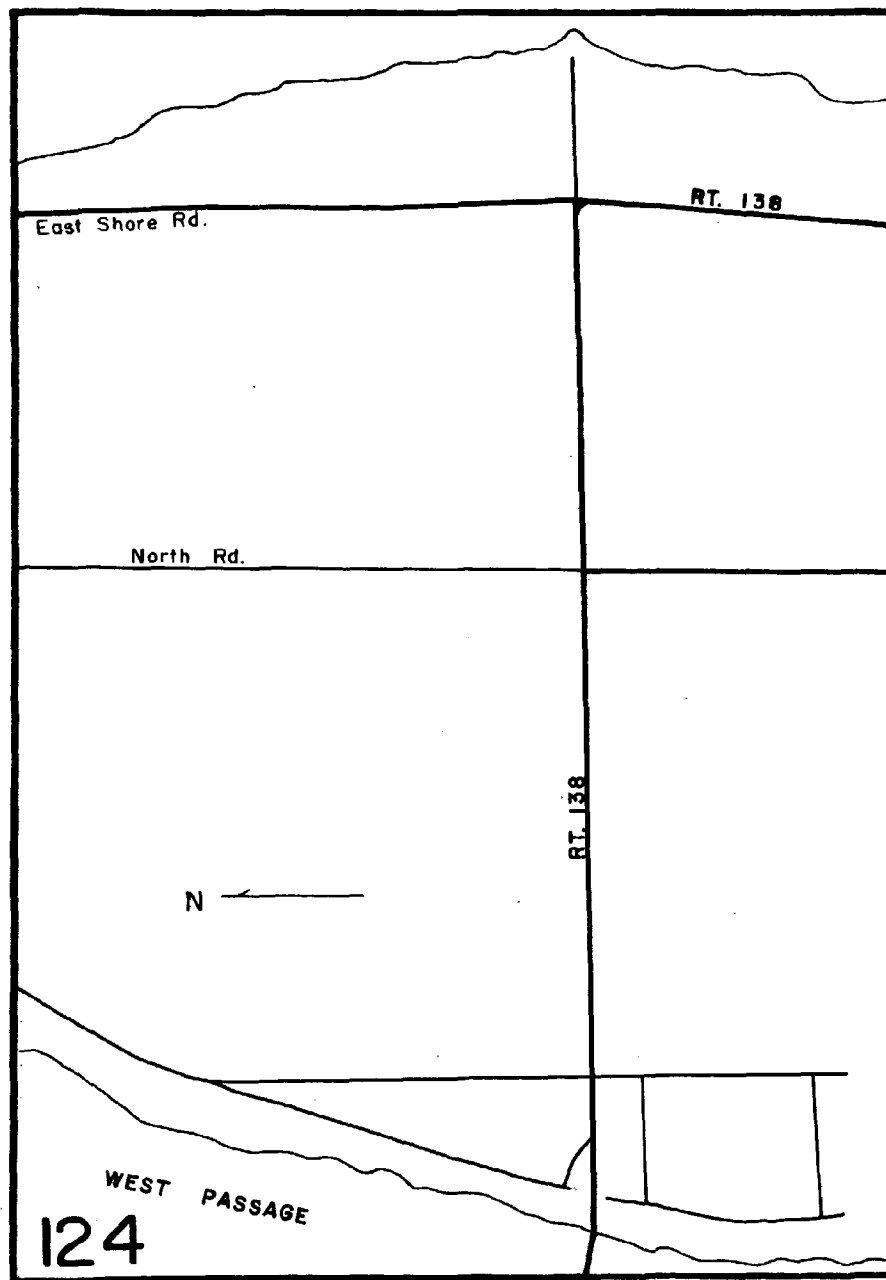


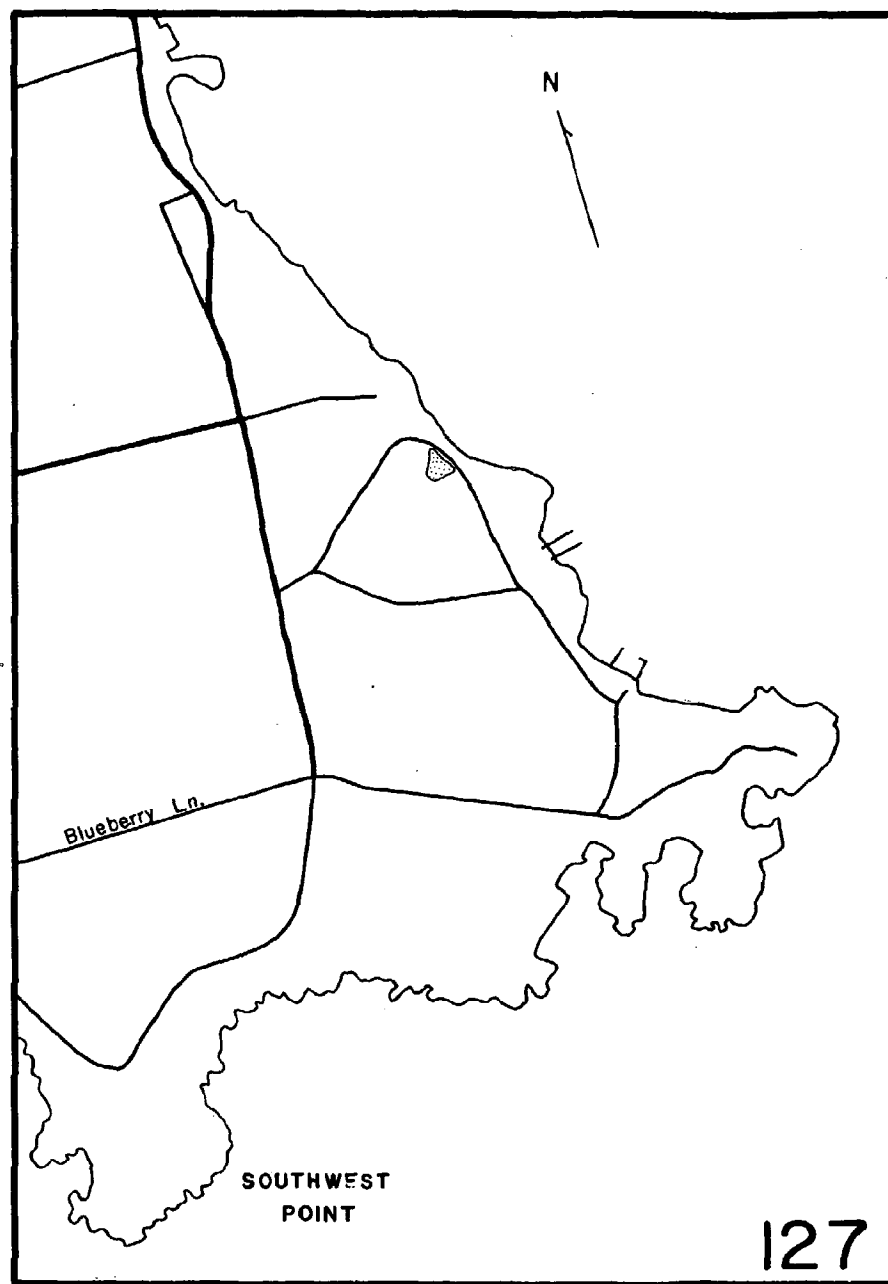
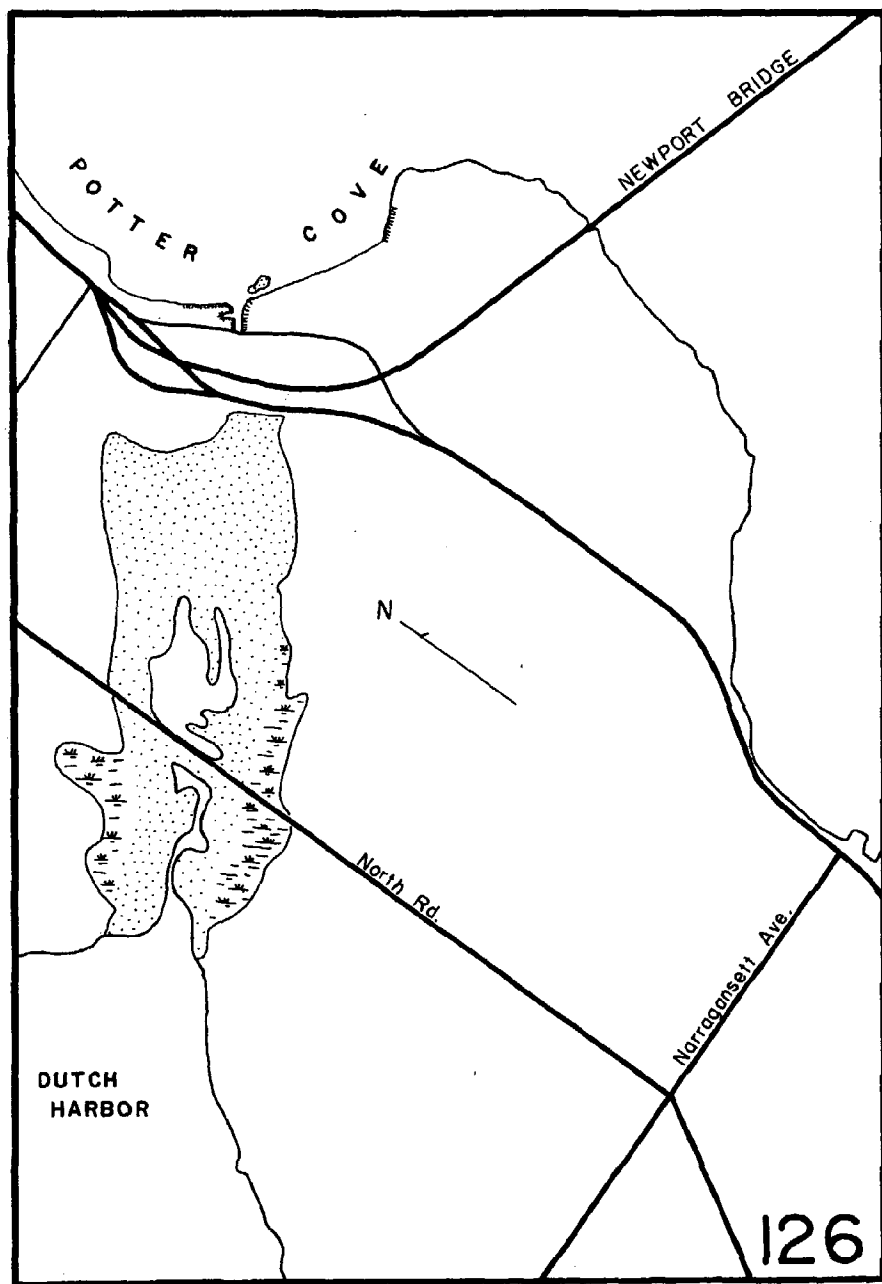


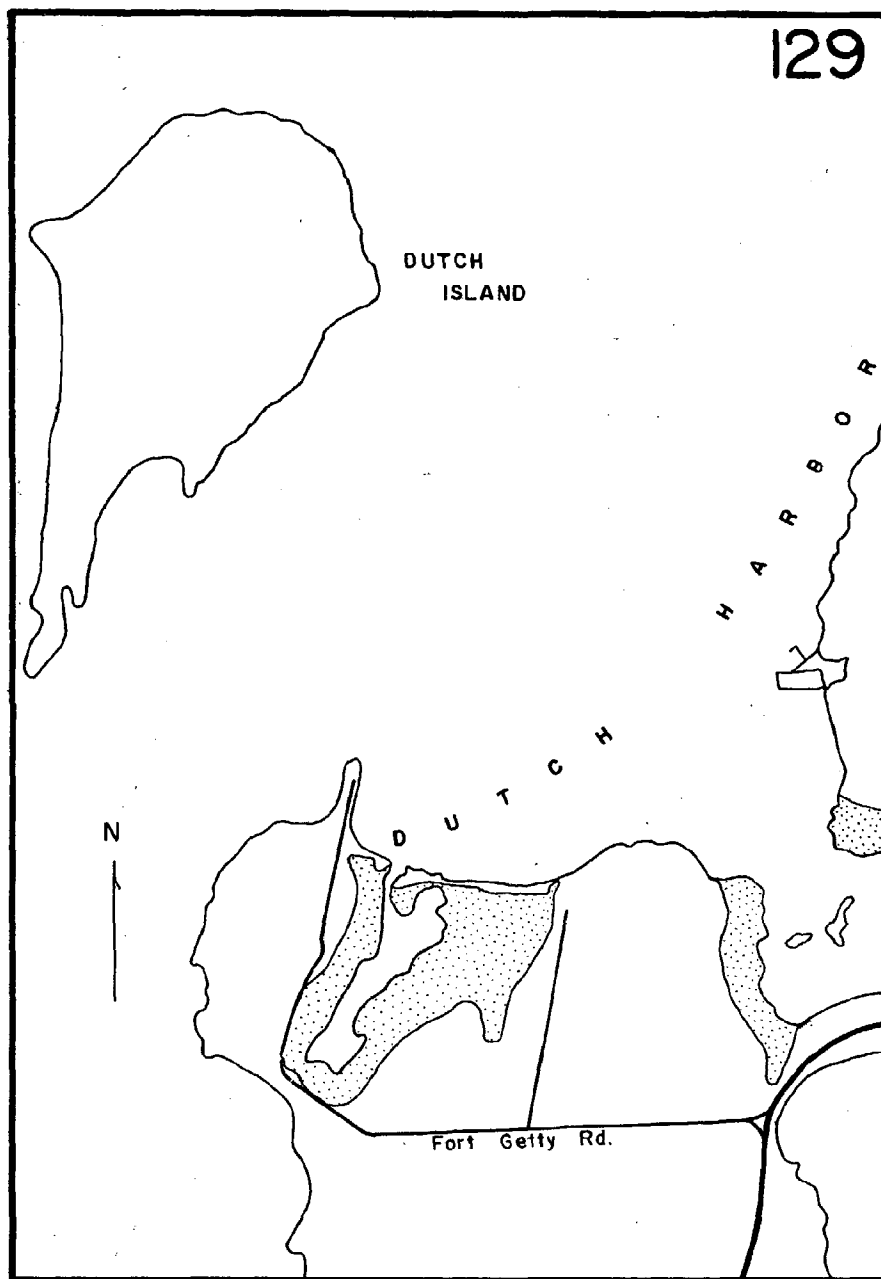
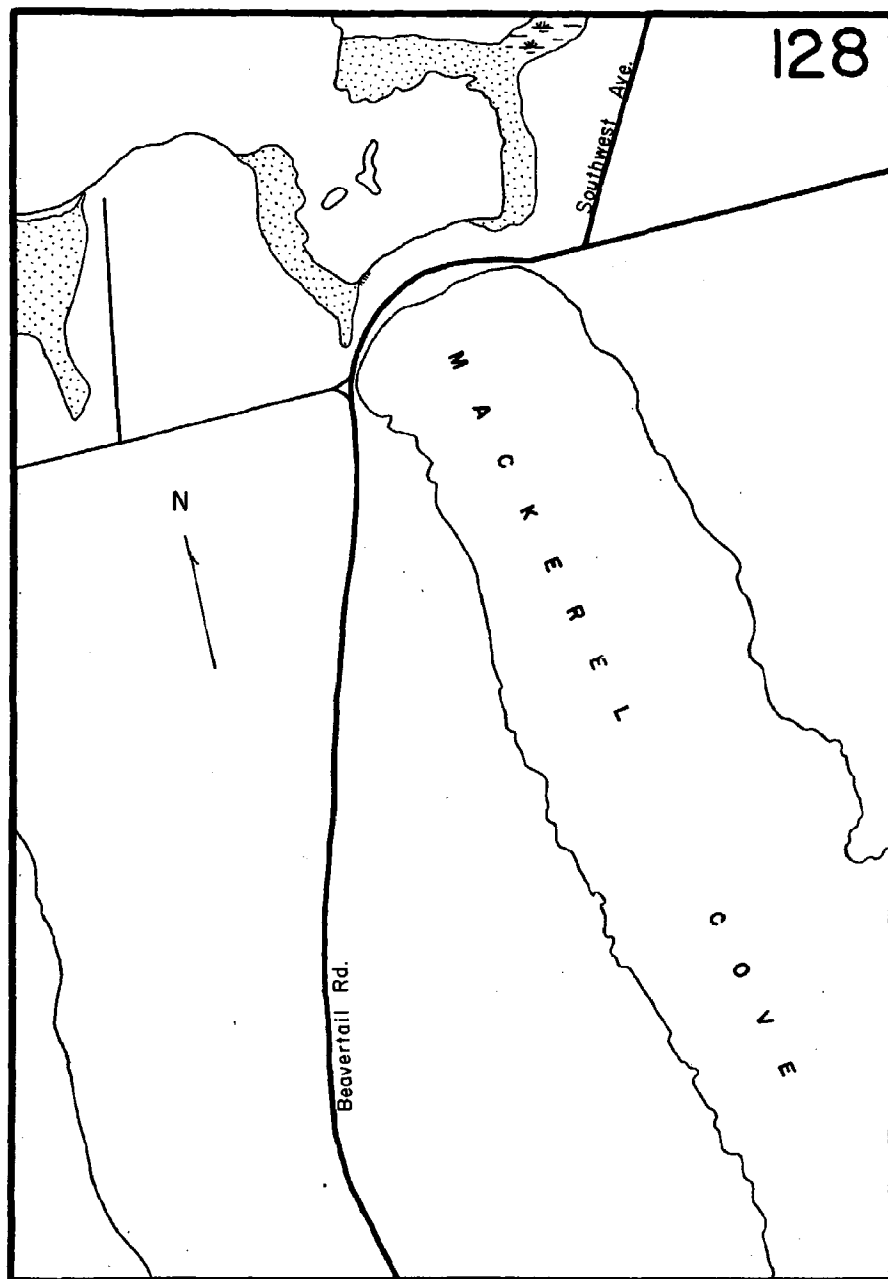


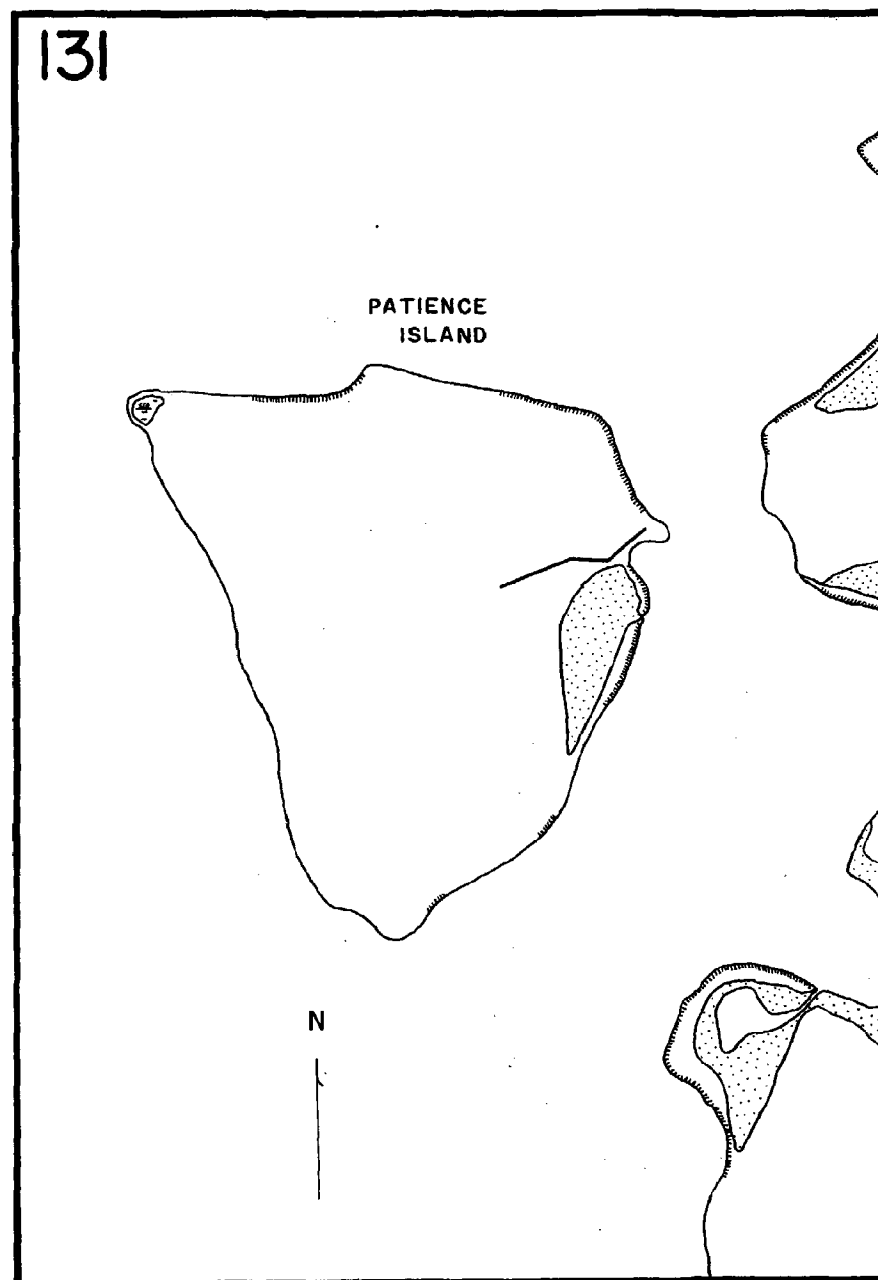
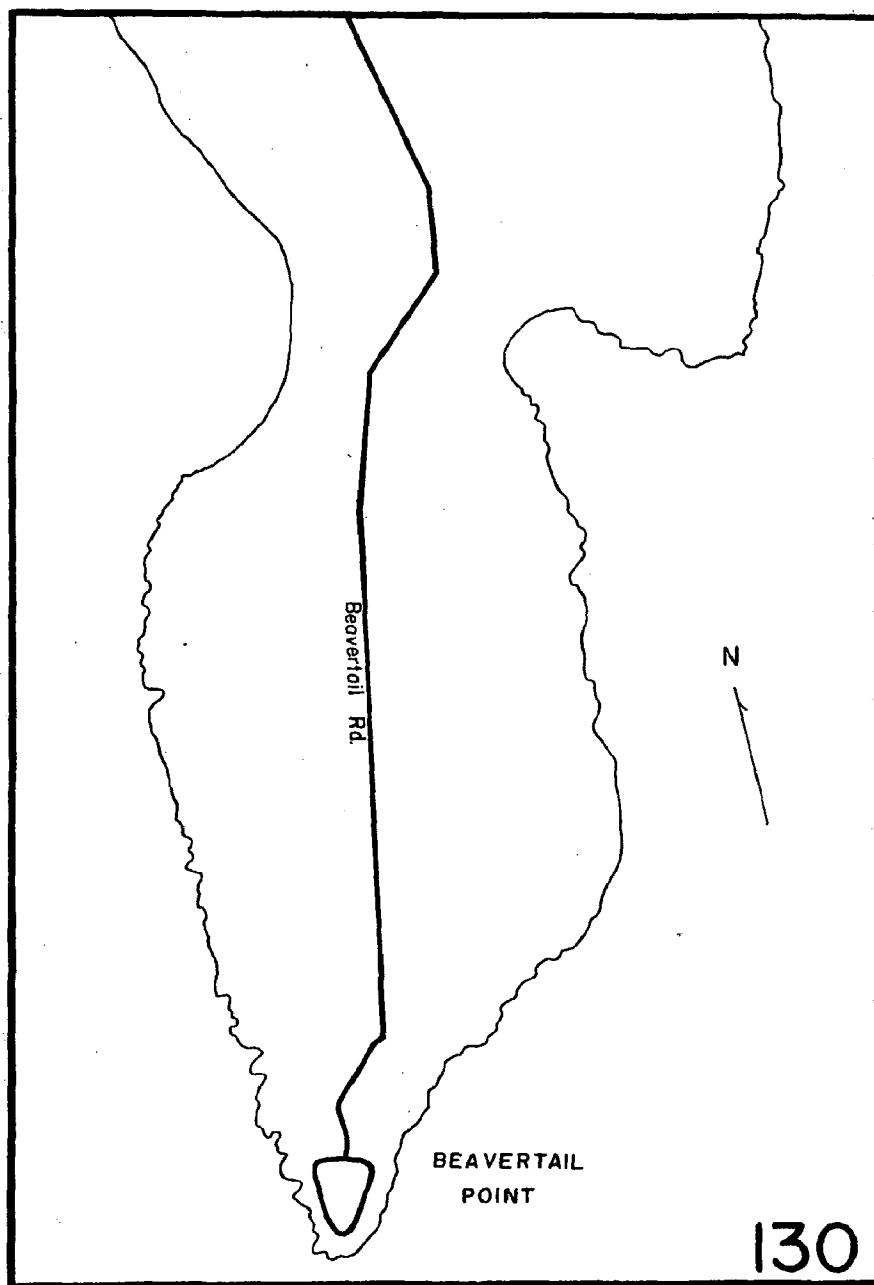




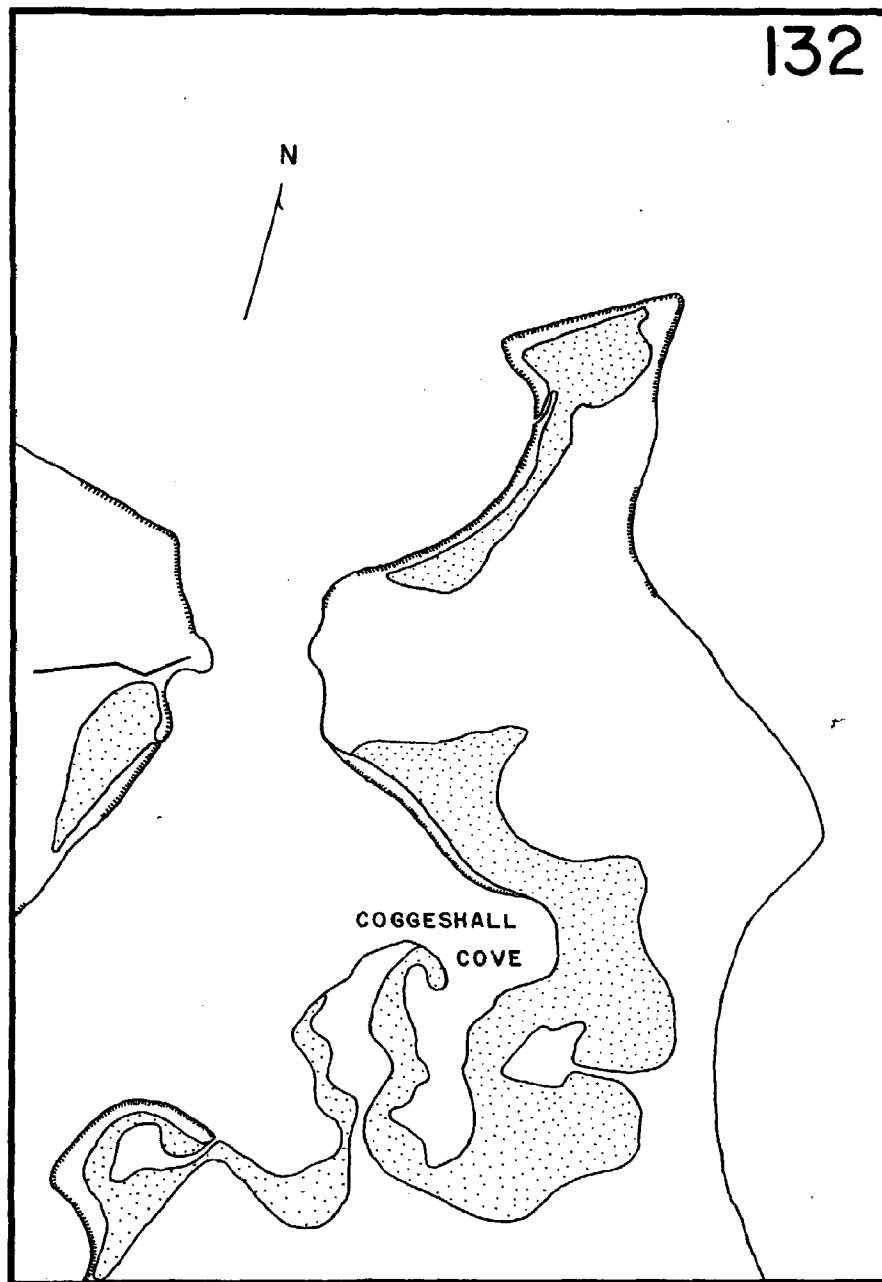




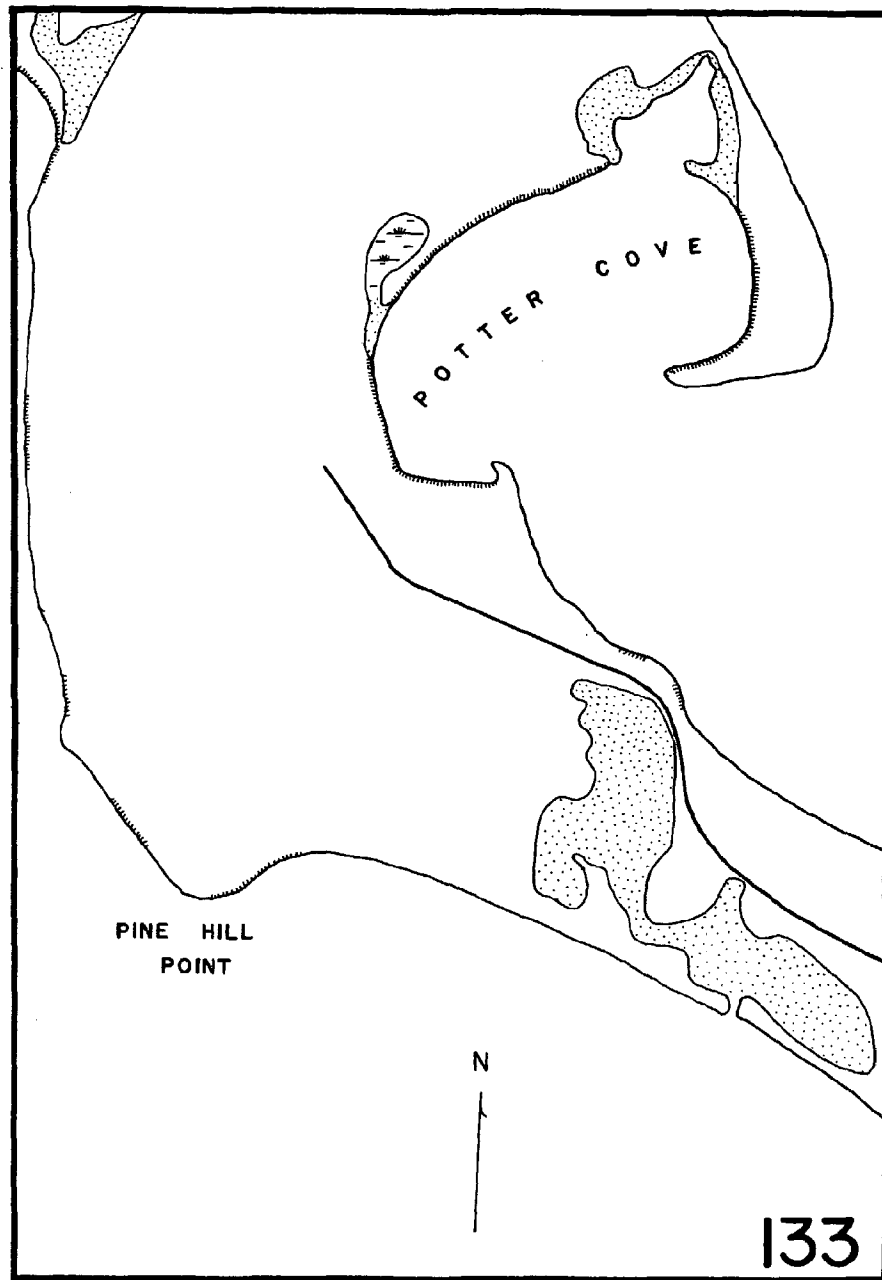




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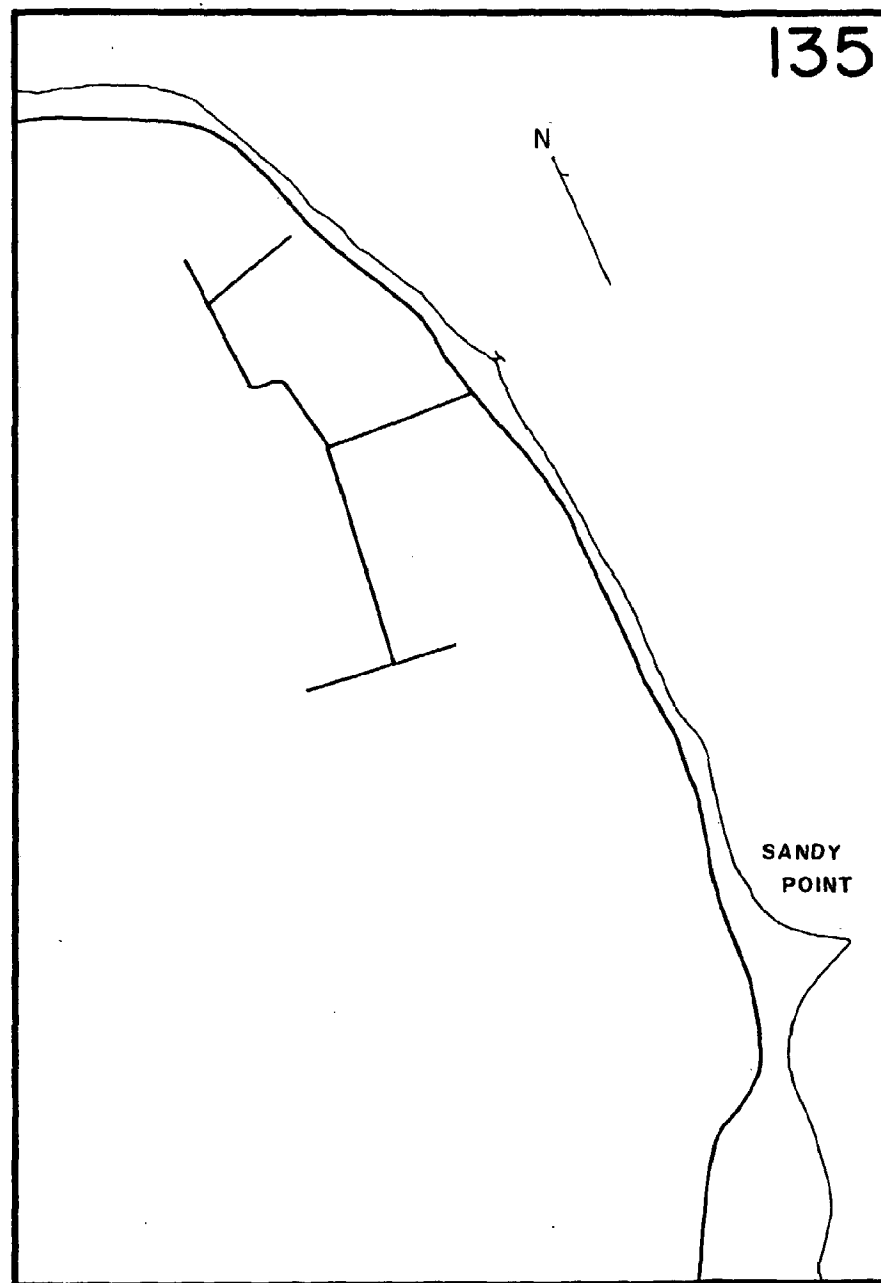
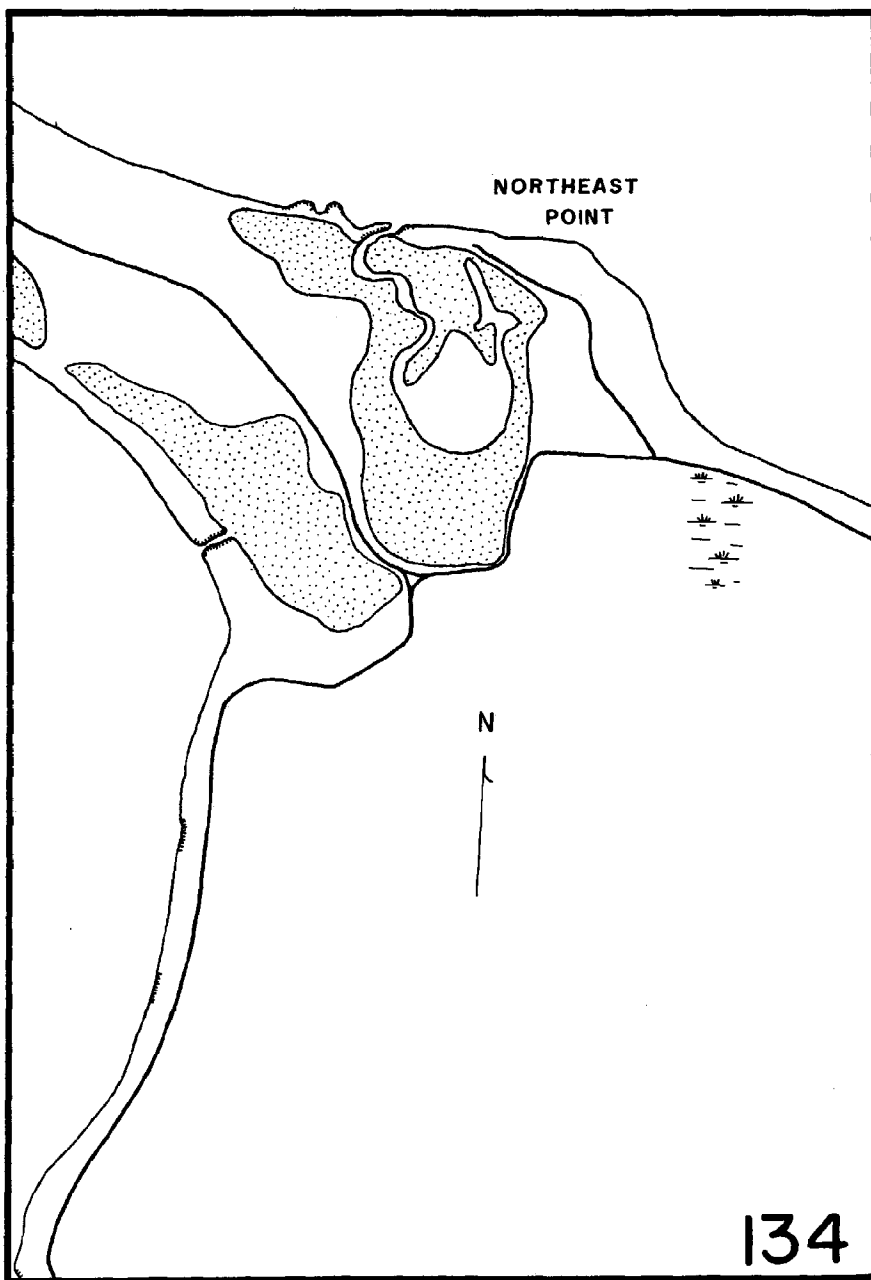
COGGESHALL  
COVE



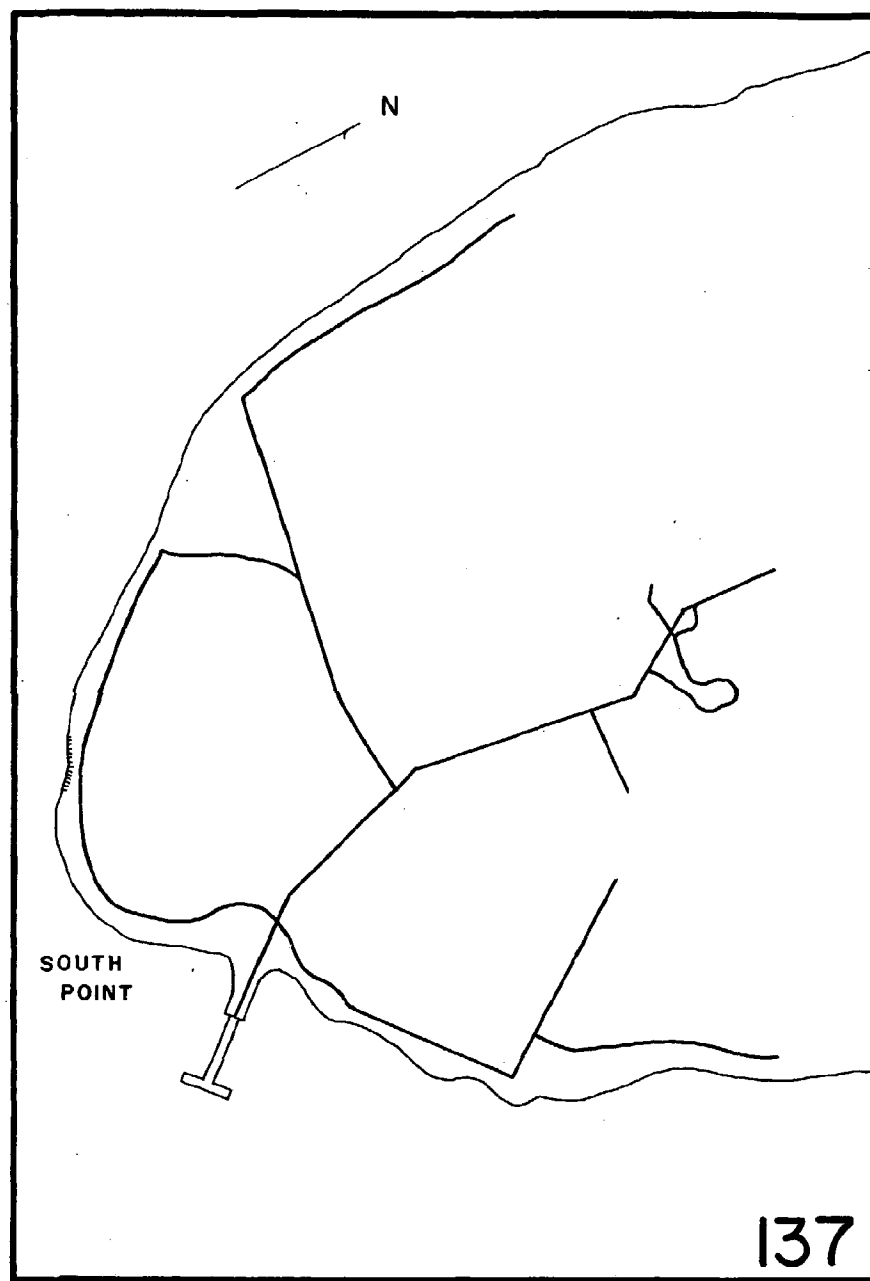
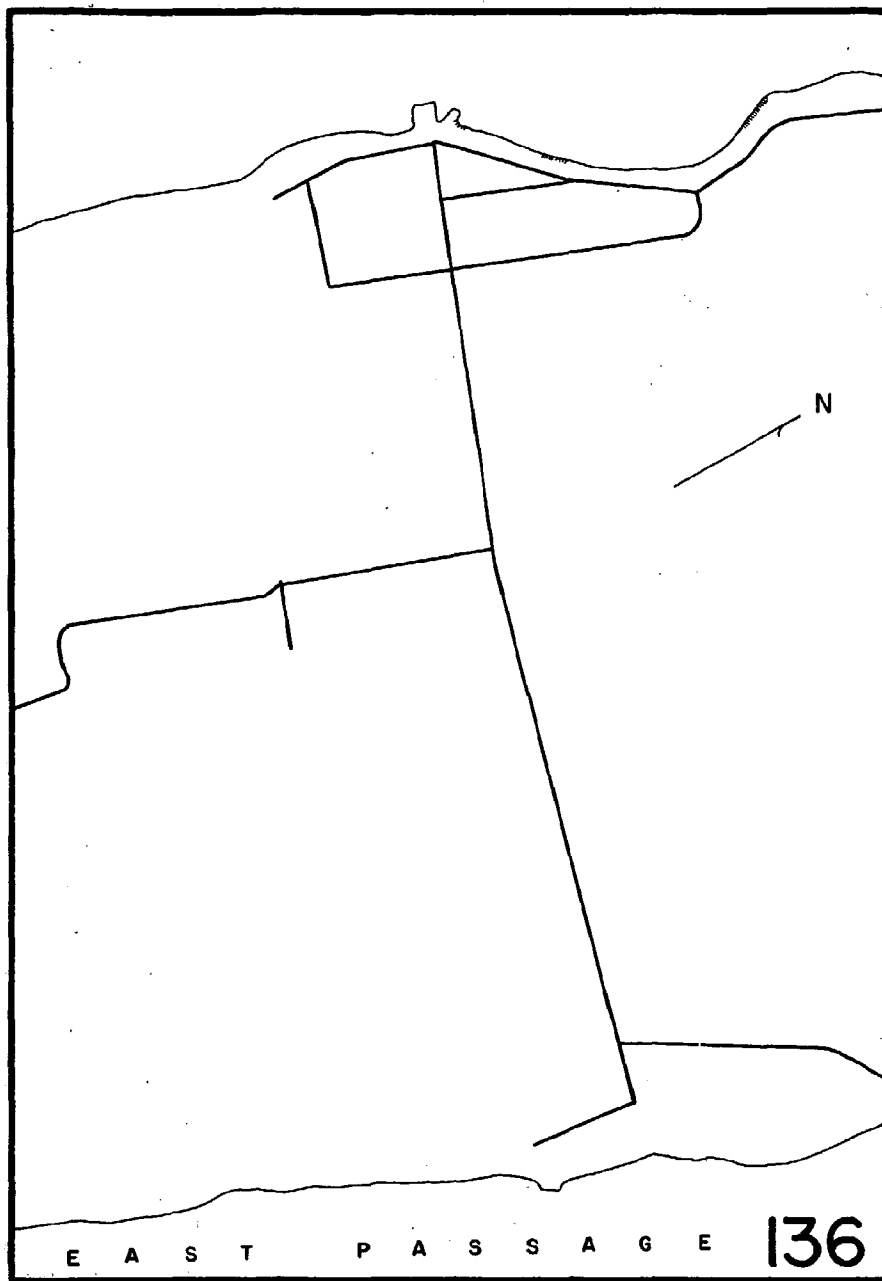
PINE HILL  
POINT

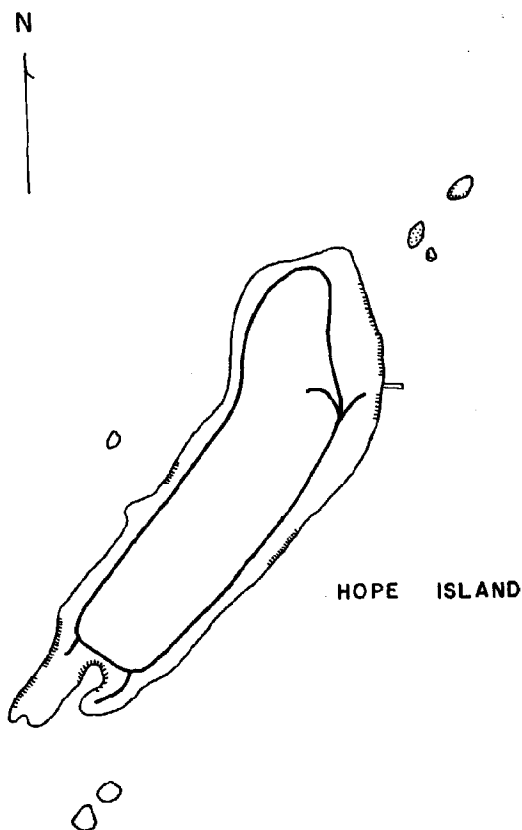
POTTER COVE

133



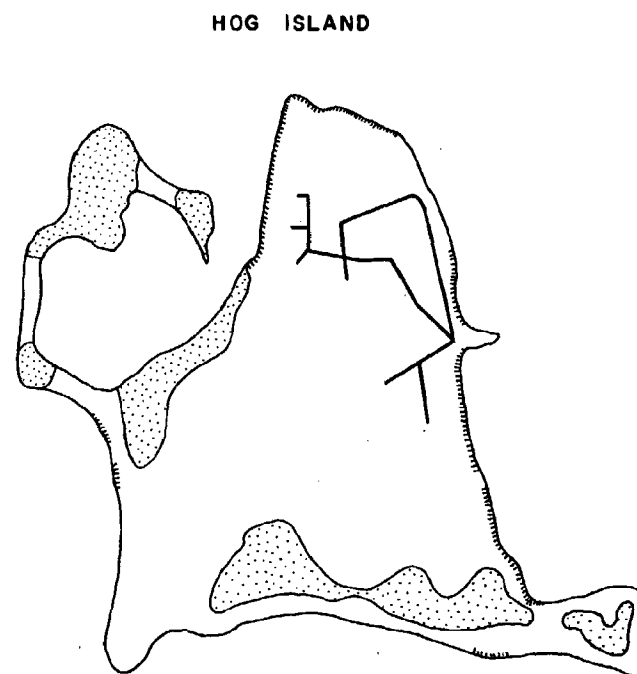






HOPE ISLAND

138



HOG ISLAND

139

N

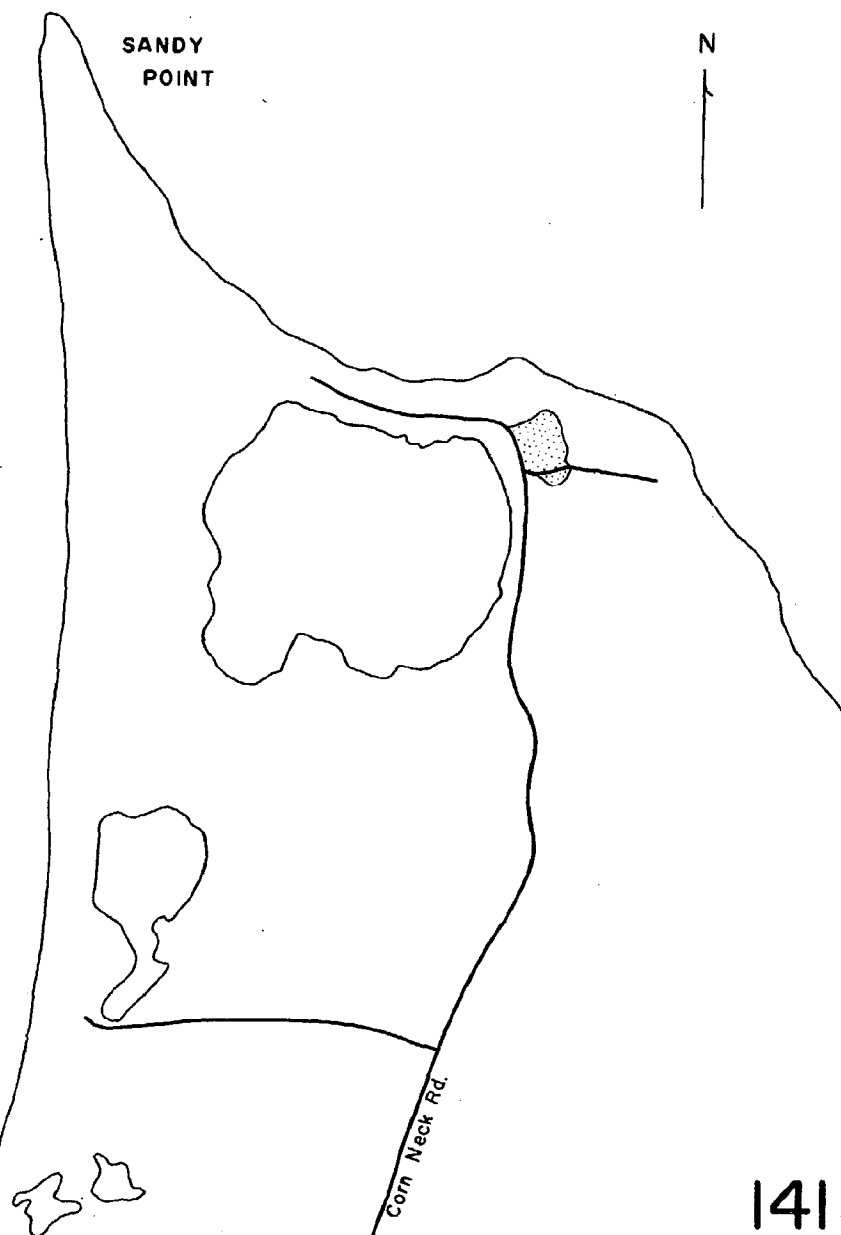


GOULD ISLAND

140

SANDY  
POINT

N



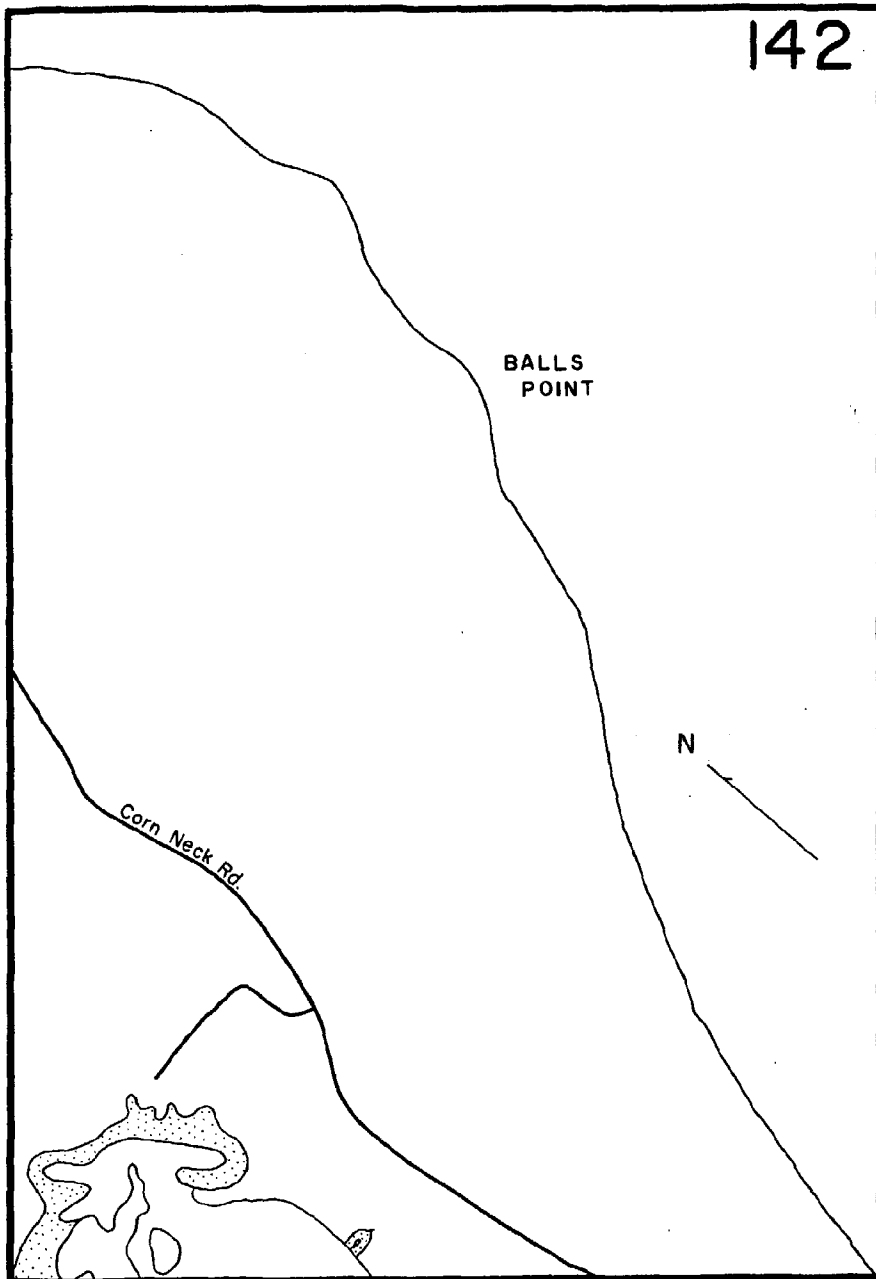
141

142

BALLS  
POINT

N

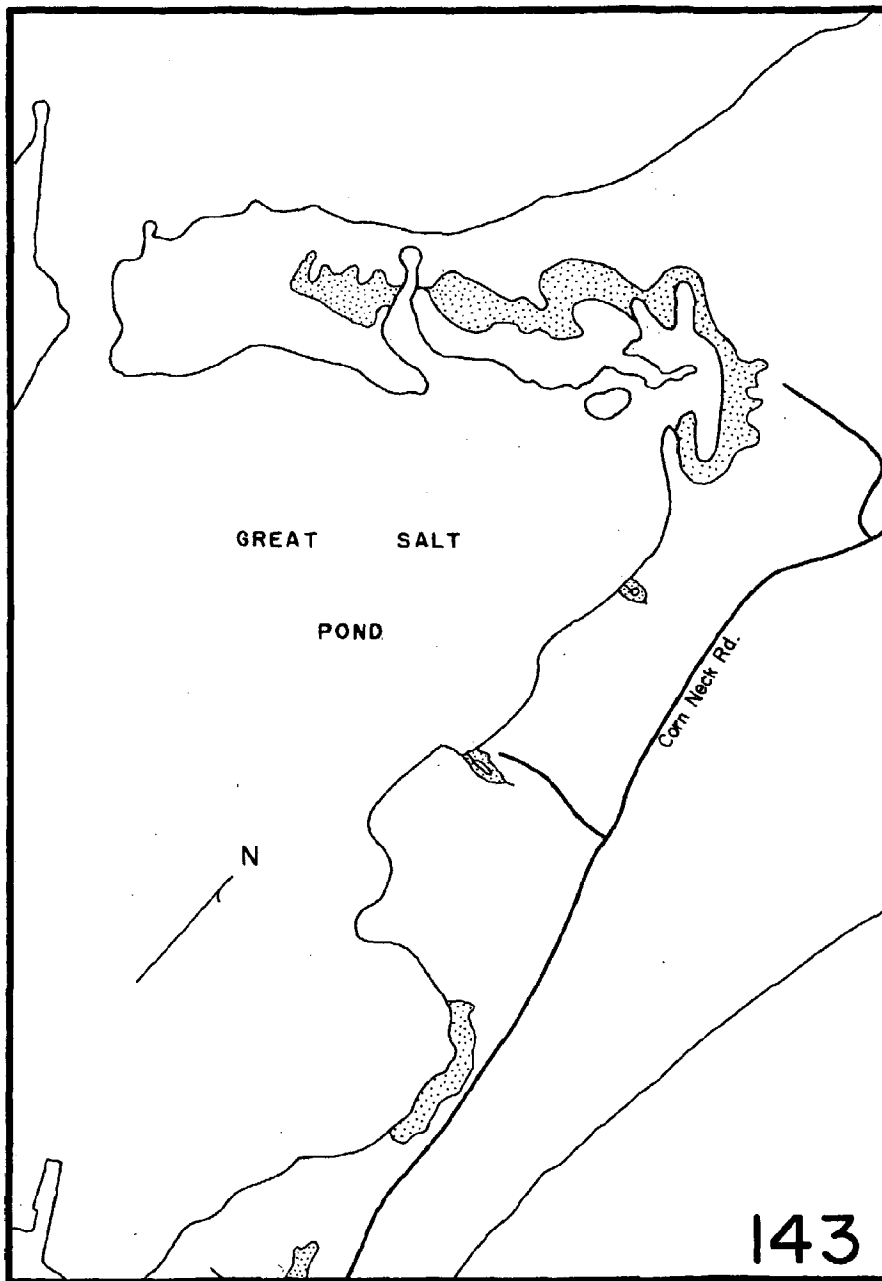
Corn Neck Rd



GREAT SALT  
POND

N

Corn Neck Rd.



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